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NetworkWorld



Code Red worms its way beyond Web servers and into other network gear.

August 13, 2001 Volume 18, Number 33

The network portal: www.nwfusion.com

SO MUCH FOR secure e-mail

Many corporate users forge ahead unprotected.

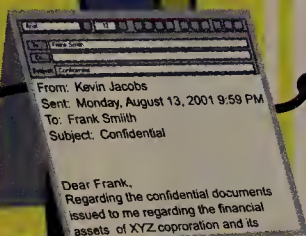
BY JOHN FONTANA

Encrypted e-mail has flopped in the enterprise.

More than five years after standards were created and vendors rushed to support them, virtually no one secures e-mail today, despite widespread concerns about prying eyes and corrupted data.

"It's almost like a black plague would have to occur before there would be a grass-roots swing toward using secure e-mail," says Joey Lawrence, a senior consultant for the Privacy Council, a Dallas company that helps companies understand and manage privacy issues. Lawrence says the number of clients that ask about encryption is close to zero. "Even in healthcare, which has the highest need for encrypted communication, there is still rampant unprotected e-mail."

See **Secure**, page 61



It's a buyer's market

Bellwether Cisco sees price-dampening conditions continuing for next several quarters.

BY JIM DUFFY AND PHIL HOCHMUTH

SAN JOSE — If one company can be a barometer for the industry, it is Cisco.

Cisco derives roughly half of its revenue from enterprises, the other half from service providers. So when the bellwether last week announced its fourth quarter and fiscal year 2001 earnings, the industry stopped to listen.

It listened for an indication of whether we had hit bottom, for signs of a turnaround or indications of more turbulence ahead.

According to Cisco, there's more turbulence ahead. The industry has not bottomed out, See **Cisco**, page 16



"This has been the most challenging year in Cisco's, and probably the industry's, history."

John Chambers, CEO, Cisco

Companies reaping the benefits from sluggish economy as network vendors wage price wars.

BY JOHN FONTANA AND DENI CONNOR

As the economy continues to churn, network executives are finding a buyer's market full of great deals that are offsetting IT budget cuts.

The dynamic has put IT buyers in a position of strength as they work to build and maintain their networks.

"We are not only in the driver's seat, we own the car," says Michael Sherwood, director of IT for the city of Ocean-side, Calif. "The buyer's market is helping us stay on track even with a tight budget."

Fresh signs of bulging buyer muscle appear almost daily, including:

- Reports from industry analysts that Intel will likely cut chip prices by nearly 50% in a See **Buyers**, page 14

Cox touting 'managed' cable VPN

BY DENISE PAPPALARDO

ATLANTA — The option of using less expensive, high-speed cable services for remote branch connectivity will get a boost this month

when Cox Business Services, the No.5 cable company in the U.S., unwraps the industry's first managed VPN cable package.

The service, which is installed, monitored and main-

tained by Cox, will let users set up IP Security (IPSec) VPN tunnels using 168-bit encryption over Cox's hybrid fiber coax cable network.

The service offers users up to 1.5M bit/sec of access for about \$700 less per month than a dedicated T-1, 1.54M bit/sec connection. Cox sets up the Managed VPN service using NetScreen 5XP firewall and VPN devices at home and branch office sites. The company also deploys a NetScreen 100 VPN device at headquarter locations to support up to

See **Cox**, page 12

BUYER'S GUIDE

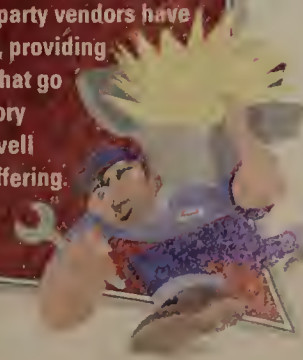
Online: See our Interactive Buyer's Guide at www.nwfusion.com.

DocFinder: 5534 Page 40

DIRECTORY MANAGEMENT

Trends: Migration and monitoring are the two key areas in which vendors are delivering tools to help you deal with your directories. **Page 38**

Roundup: Third-party vendors have jumped into the fray, providing a range of add-ons that go beyond what directory vendors such as Novell and Microsoft are offering.





"Linux is so totally dreamy!"

WHY *LINUX* HAS MORE FANATICAL DEVOTEES THAN A TEEN POP IDOL.

FIRST THE BRITISH INVASION. Now Linus Torvalds. One used mop tops and catchy beats to create a worldwide frenzy. The other used the arguably less sexy but equally effective concept of open standards. When he created the Linux® operating system, Torvalds opened the gates to a true global software meritocracy. With Linux, anyone can share, refine and customize code that is freely accessible, open and available to all.

What does this mean for real e-business? It means that new e-business infrastructures can be rapidly adapted to particular business tasks. Companies will no longer be forced to adjust their processes to the only software available. And since Linux is now the fastest-growing operating system, it's where cutting-edge technologies will be created, and where the greatest number of programmers will appear. Linux is hardware-agnostic, so it can quickly begin to remove the cost-intensive

task of integration across disparate platforms. These aren't just software advantages, they are real business advantages: reduced costs, faster time-to-market, competitive edge and flexible e-business infrastructure.

Now the Linux community has a powerful, perhaps even unexpected, ally in IBM. The people at IBM are committed to helping Linux grow through new technology, devoted specialists and active support of the entire Linux movement. From across-the-board enablement of IBM servers and software, to thousands of dedicated developers and technical support experts, to porting centers where IBM Business Partners can test and refine their applications for Linux, IBM is backing Linux wholeheartedly.

It's exciting stuff. And this is just the beginning. So if you think you can keep your composure, visit us at ibm.com/e-business for more information.



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NetworkWorld

AUGUST 13, 2001

- 8 **Proposed Web messaging protocol** sparks tampering concerns.
- 10 **Code Red worm** continues to wreak havoc — and not just with Web servers.
- 10 **Verity** improves enterprise search software.
- 12 ISP **Speedera** touts turnkey content delivery network, streaming video packages.
- 14 **Security** is top worry among IBM users, survey says.



Globix executive keen on CDN technology.

Page 12

Infrastructure

- 17 Midwestern bank embraces **voice over IP** — while hanging on to NetWare IPX servers.
- 17 **EMC** software boosts storage options.
- 18 **Dave Kearns**: The Tower of BabML.

Net.Worker

- 21 **Teleworking Top 10**: Shopping with **peripheral vision**.

Carriers & ISPs

- 23 Furniture maker moves into **convergence** with **AT&T** service.
- 23 **Metricom's bankruptcy** leaves **WorldCom** without mobile wireless.
- 24 **Johna Till Johnson**: Now is the time to negotiate with your carriers.

SPECIAL FOCUS: CDNs. Content delivery networks get positive reviews from early users. **Page 26.**

The Edge

- 27 **Corrigent** touts Resilient Packet Ring breakthrough.
- 27 **DOCSIS** compliance delaying cable IP telephony.

Enterprise Applications

- 29 **Kontiki** keen on content delivery plan.
- 29 **Siemens, Fischer** bring metadirectory to mainframe.
- 30 **Palm** gets a tighter grip on documents.
- 30 **Scott Bradner**: A blurry vision?

Technology Update

- 31 **Bluetooth 1.1** addresses interoperability issues.
- 34 **Mark Gibbs**: Still more FTPing.

Management

- 44 **Noncompete or not?** Noncompete agreements can keep IT talent from flying the coop and singing about your trade secrets.

Why noncompete agreements are good for business.

Page 44

BUYER'S GUIDE

Trends: Migration and monitoring are the two key areas in which vendors are delivering tools to help you deal with your directories.

Page 38

Roundup: Third-party vendors have jumped into the fray, providing a range of add-ons that go beyond what directory vendors such as Novell and Microsoft are offering.

Page 40

Online: Interactive Buyer's Guide (www.nwfusion.com)

DocFinder:5534

LOOKING FOR a Layer 2 / Layer 3 Gigabit switch that delivers near wire speed over Cat 5 cable? We tested Cisco's new Catalyst 3550 and 2950 midrange switches and found that they delivered high performance and solid management features.

Page 43

NetworkWorld
REVIEW

Editorial: 3Com bounces around as it tries to bounce back. **Page 36.**

Russ Cooper: A call for responsible disclosure in Internet security. **Page 37.**

James Kobiulus: Microsoft's FUD-filled .Net strategy confuses customers. **Page 37.**

Backspin: Going for the gold at the IT Olympics. **Page 62.**

'Net Buzz: Start-up Zembu looks to speed delivery of transactional applications. **Page 62.**

Net Know-It-All.....Page 14
Ask Dr. Internet.....Page 31
Message Queue.....Page 36
Editorial and advertiser indexes.....Page 60

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guinea pig⁽ⁿ⁾

Compaq is abandoning their Alpha chip
for a new, unproven platform.
Don't worry, it's just your business.

Forced migrations are never fun. Especially when you're forced to migrate to an unproven platform. Don't be a test site for the first-generation Itanium chipset. Switch to Sun's third-generation 64-bit SPARC™ platform. SPARC, along with the Solaris™ Operating Environment – the #1 UNIX® platform, is battle-tested for maximum uptime of your mission-critical applications. Plus, more applications are available for the Solaris OE than for either Alpha or Itanium. And you can run those applications on anything from our sub-\$1,000 server to a massive 64-way mainframe-class machine (can't do that with Itanium), giving you an architecture that is both cost-efficient and powerful. Worried about your existing investment? No problem. The Solaris OE can integrate seamlessly into your existing architecture, so there are no changes to your applications and no retraining of resources. And to make the switch even easier, migrate now to take advantage of our aggressive Alpha trade-in program. For details, visit www.sun.com/alpha.

take it to the nth



THIS WEEK
ONLINE

NetworkWorldFusion

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NEWS

Code Red

The Code Red worm in all its variants continues its destructive spread. The virus' impact has broadened as Cisco equipment embedded with Microsoft Internet Information Server is also vulnerable. Read this online story, share your experiences in our forum and get the latest Code Red news and resources with our breaking-news page. **DocFinder: 5539**



FORUMS

The role of MPLS

Our story last week on Multi-protocol Label Switching and the Internet generated considerable controversy. Is the technology really bad for the Internet? Jump into the debate. **DocFinder: 5540**

Wireless LANs

Also generating discussion has been our story on the future of high-speed wireless LANs. Put your 2 cents into the debate, and read how to build your own 802.11b antenna system. **DocFinder: 5541**

VPN from anywhere?

A user seeks help finding a satellite-based VPN system or service. Know of one? Used one? **DocFinder: 5542**

BUYER'S GUIDE

Interactive guide: Directory management tools

Looking for help in managing your directory? Our interactive Buyer's Guide chart has information on 13 products to help you find a solution. Or use our "Compare-o-matic" feature to compare two products. **DocFinder: 5534**



Net Know-It-All

Congratulations to Harry Morton (also known as "HarryMonkeyDog") from Melbourne, Fla. He's July's Net Know-It-All winner. Who will be the winner in August? Play Net Know-It-All every week and increase your chances. **DocFinder: 5543**

Getting NetSmart

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CARUSO'S CACHE

The best of the NetFlash daily newsletter



FBI ordered to reveal PC snooping technique

The FBI has a way of recording keystrokes on citizens' computers and used the technology to get a password to an encrypted file it wanted to use in a case. A judge wants to know how this recording method works — but the Department of Justice is pushing back. **DocFinder: 5551**

Adobe, Xerox tiff slows Internet fax standard

We've reported on a couple of standards under attack at the Internet Engineering Task Force (IETF): Multi-protocol Label Switching and Internet Key Exchange (IKE). Now add another one to the mix, as a pending Internet faxing standard grinds to a halt. **DocFinder: 5552**

Supercomputer to use 3,300 Intel Itanium processors

Imagine more than 3,300 processors all working on the same thing. Such a supercomputer would be able to perform 13.6 trillion calculations per second. It would also be used strictly for scientific applications, so you won't be able to put it in your server farm anytime soon. **DocFinder: 5553**

IETF takes on IKE, Internet routing, Code Red

One high-profile debate at the Internet Engineering Task Force (IETF) meeting this week was the future of the Internet Key Exchange (IKE) protocol. Three of the IETF's leading security experts recently sent a message to the IP Security working group reiterating a moratorium on IKE development that has been in place for about a year.

Their concern is that IKE is already so complex that they can't prove it's secure enough. Instead, these security experts recommend developing a streamlined, next-generation IKE protocol, which working group members have dubbed "Son of IKE." **DocFinder: 5550**

— Jeff Caruso, managing editor, online news

Sign up for this e-mail newsletter online. **DocFinder: 3850**

COLUMNISTS

Compendium

Shotgun approach

Fusion Executive Editor Adam Gaffin explains how AT&T Broadband plans to reduce Code Red traffic on its cable-modem service. **DocFinder: 5544**



Keeping Current

Severance pay

Fusion Columnist Fred McClimans advises the newly laid off about severance, stock vesting, insurance and unused vacation time. **DocFinder: 5545**



View from The Edge

The numbers are in

The Edge Managing Editor Jim Duffy shows how sales of ATM services will more than double in the next three years. **DocFinder: 5546**



NEWS BRIEFS, AUGUST 13, 2001

Hope seen for routing tables

The growth of the Internet's backbone routing tables may not be so catastrophic after all, says Randy Bush, co-director of the Internet Engineering Task Force's (IETF) Operations and Management Area. Addressing an IETF gathering last week, Bush unveiled data that shows how ISPs can use filtering to contain the growth of the routing tables long enough for router manufacturers to build more powerful routers. "Don't panic," Bush says. "We're engineers." Bush agrees with previous studies that show the main cause of routing table growth is the rise in multihomed networks, where corporations hook up to two or more ISPs to ensure reliable communications. Bush refers to this as "grazing the commons," whereby corporations get the benefits of multihoming while ISPs carry the cost of purchasing more and larger routers. He recommends that ISPs filter — or stop listening to — some of the route announcements sent by multihomed networks. This alone will reduce router table entries from growing 90% over the next three years to growing 50%, he says.

Supreme Court asked to toss Jackson ruling

Microsoft last week asked the U.S. Supreme Court to review an appeals court ruling that it illegally used its monopoly power in the market for PC operating systems to harm rivals. The company argued in court papers that the U.S. Court of Appeals for the District of Columbia should have thrown out all of District Court Judge Thomas Penfield Jackson's findings and proposed remedies because of comments the judge made to the press while he was trying the case. In addition to its filing with the country's highest court, Microsoft asked the appeals court to hold off on sending the case back to the district court level until the Supreme Court has a chance to decide on whether it will hear the case. A new trial court was expected to revisit the case as early as the end of this week to begin work on deciding new remedies to impose on Microsoft; the Supreme Court would be unlikely to hear the case until its October term begins. In its ruling on June 28, the Court of Appeals admonished Jackson for violating legal codes of conduct when speaking to reporters from the *New York Times* and *The New Yorker* magazine about the case.

Covad files for Chapter 11

Covad Communications Group, the parent company of national DSL provider Covad, last week filed for Chapter 11 bankruptcy in an effort to reorganize its business. Company officials say the reorganization, which would eliminate about \$1.4 billion in debt, shouldn't affect the day-to-

day operations of the DSL provider. Covad says a number of bondholders, representing a majority of the \$1.4 billion in debt, have already agreed to a debt restructuring, which would see the bondholders exchange their bonds for a combination of cash and preferred stock in Covad. The cash would consist of 19 cents on the dollar, with the remainder coming in preferred stock, the company said. The announcement comes one week after the resignation of Covad CFO Mark Perry and the Chapter 11 filing of national DSL competitor Rhythms NetConnections.

HP buys net management company

Hewlett-Packard has agreed to buy privately held company Trinagy, a producer of software for the management and tracking of advanced network performance. Terms of the deal were not disclosed. The acquisition will be used to enhance HP's services, including its OpenView e-services management software, the company said. The computer and printer maker will use the Trinagy line of software to quickly identify network performance problems.

Intel touts supercomputing system

Intel said last week that its Itanium family of processors will be used to build a distributed scientific computing system it claims will be the largest of its kind. The supercomputing system, called TeraGrid, is part of a \$53 million award by the National Science Foundation to four facilities to do scientific research. Creating a Distributed Tera-scale Facility, Intel says TeraGrid will link computers powered by more than 3,300 Intel Itanium processors. It will be capable of more than 13.6 trillion calculations per second, or 13.6 teraflops, and have the ability to store, access and share more than 450 trillion bytes of information. Researchers across the U.S. will be able to access the facility to quickly analyze, simulate and solve scientific problems.

Quantum snaps up storage vendor

Quantum has announced that it will acquire Connex, a storage company that makes network-attached storage appliances. Connex, a division of Western Digital, makes midrange storage appliances, as well as monitoring and management software called SANavigator. The SANavigator products are not included in the pending acquisition, however. Western Digital has spun that part of Connex into a separate company called SANavigator.

Proposed Web protocol sparks tampering fears

BY CAROLYN DUFFY
MARSAN

LONDON — A proposal to create a standard communications protocol that would let Internet devices automatically personalize, translate or otherwise adapt Web pages in useful ways is generating strong criticism in the Internet engineering community because it also could be used to tamper with Web content.

Dubbed Open Pluggable Edge Services (OPES), the proposal envisions a new class of Web services similar to content delivery networks (CDN) and caching systems, which speed the delivery of Web pages. OPES devices would be attached to these systems to provide Web publishers with add-on features, such as reducing the size of Web pages to fit handheld devices or slowing multimedia streams for low-bandwidth connections.

Companies promoting OPES include AT&T, Lucent, Novell, Intel, CacheWare and CacheFlow. These companies want to develop an industry standard to ensure that OPES devices from different vendors can communicate with each other across the Internet.

OPES supporters held a meeting in London last week to try to persuade the Internet Engineering Task Force (IETF) to create a working group to pursue their concept.

While the OPES proposal sounds benign, it is controversial within the IETF community because OPES devices could be used to change Web content without the approval or knowledge of Web publishers. OPES critics also say the concept breaks the revered end-to-end architecture of the Internet by letting intermediary systems intervene in communications.

"The problem with the OPES group was that it appeared to be developing a mechanism to make it easy for unauthorized third parties to modify content in transit — say by ISPs to insert advertisements," says Keith Moore, an outspoken critic of OPES and former director of the IETF's Applications Area.

"The proposed OPES charter has since been modified to clarify that the parties that modify content do require explicit authorization," Moore adds. "However, there are still indications that some OPES proponents are wanting to standardize an interface [by] which unauthorized modifications can be made."

After the IETF leadership announced in June that an OPES working group was proposed, the group's mailing list was flooded with negative messages, including one that called OPES "evil incarnate."

The Center for Democracy and Technology recently entered the fray, sending a letter to the IETF's external liaison and *Network World* columnist Scott Bradner outlining the advocacy group's concern that OPES would create an open standard for the unauthorized manipulation of Web content.

IETF leaders say OPES has been criticized unfairly as creating transparent interceptors, when in fact the group's goal is to create devices that only modify Web content with the permission of Web publishers, CDN providers or ISPs.

"What OPES is about isn't evil intermediaries," says Harald Alvestrand, chair of the IETF. Instead, OPES sets up specialized boxes called proxies that off-load functions from Web servers or clients, and these proxies "do interesting things," he says.

The IETF leadership is expected to decide as early as this week whether to create an OPES working group.

See **OPES**, page 61

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PATENT FLAP OVER 'NET FAX'

Read why the Internet Engineering Task Force has halted plans to develop a common way of sending faxes over the Internet.

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Code Red worm continues to wreak havoc

BY ELLEN MESSMER,
JASON MESERVE AND
PHIL HOCHMUTH

Perhaps the worst thing about the recent Code Red virus attacks isn't the damage it has caused but what it could still do.

Code Red and Code Red II exploit a hole in Microsoft's Internet Information Server (IIS) software that lets nefarious users commandeer a victim's machine. Last week the Code Red worm continued its destructive spread, not only finding its way into hundreds of thousands of Microsoft Web servers, but also affecting the performance of a broad range of Cisco equipment, including DSL routers within the Qwest Communications network.

In addition, cable Internet providers such as AOL Time Warner, AT&T, Cox Communications and Excite experienced network slowdowns as a result of worm-related traffic jams. Hewlett-Packard too has reported problems with its Procurve switches.

But while IT professionals are battling the spread of the worm, they may not be digging deep enough because potentially millions of Microsoft Web servers on the Internet, plus untold other devices — including a range of Cisco gear — run embedded IIS. Experts say any product with IIS needs to be



updated with the software patch from Microsoft to prevent infection from Code Red.

"The larger story about Code Red II is that Microsoft IIS is bundled into all kinds of applications, and people don't realize they have to protect these, too, against Code Red," says Dennis Treece, director of special operations at vendor Internet Security Systems. He added that the IP addresses of Code Red-infected machines are being shared in the online chat rooms of the hacker underworld.

But like many in the security community, Treece says IIS users aren't heeding the call to patch everything in an effort to stop Code Red II's spread. Code Red II employs what's known as a back-door Trojan horse that,

"The larger story about Code Red II is that Microsoft IIS is bundled into all kinds of applications, and people don't realize they have to protect these, too, against Code Red."

Dennis Treece, director of special operations, Internet Security Systems

once inside an IIS machine, lets anyone with a Web browser manipulate or destroy files. For example, Windows 2000 Professional edition from Microsoft includes IIS, so a laptop could easily become infected, notes NTbugtraq editor Russ Cooper. And VPNs are no defense against Code Red. "Is little Johnny's computer at the CEO's home continually reinfecting your internal network over daddy's VPN?" he asks.

Specifically, IIS is included with many network products as a management interface. That includes Cisco CallManager, Cisco Utility Server, Cisco uOne, Cisco ICS7750 and Cisco Broadband Service Manager. Older versions of CiscoWorks 2000 RWAN/CWSI Campus Version 2.X and

Cisco Voice Manager Version 1.X are also directly vulnerable because IIS was required as part of the installation. All this equipment can potentially be victimized by Code Red II, acknowledges Cisco spokesman Steve Langdon.

"The problems aren't limited to one type of device or brand of products," Langdon says. "If the patch is not downloaded and applied to the software, then that device is susceptible to whatever damage the worm can cause. It could be a router, or it could be a laptop."

Code Red II has infected hundreds of thousands of machines, bringing Internet cable-modem services from Cox, AOL Time Warner and Excite to a crawl as infected PCs and Web servers

attacked each other with floods of address requests and IP scans in search of further IIS victims.

Last week Cox was disconnecting subscribers' Code Red-infected machines from the cable service. And Code Red sporadically knocked offline Qwest's Cisco DSL routers — which don't include IIS but were vulnerable to its address resolution floods.

Businesses including Motorola, Associated Press (AP) and IBM lost Web access as a result of Code Red.

Motorola suffered as Code Red II invaded its global intranet, and the company shut down its Web services, resorting to faxes and phone calls to replace e-mail.

AP found its Internet communications curtailed a few days last week as its IT staff "scrubbed clean" the array of IIS Web servers used internally for news distribution, says spokesman Jack Stokes. Code Red II delayed updates on AP's Web site and affected a photo service used by smaller newspapers. AP's satellite communications were unaffected.

Ironically, Microsoft's own MSN Hotmail servers were infected by the Code Red II worm because Microsoft had failed to patch its own servers.

The author of the Code Red II worm isn't known, but many security experts think it's the work of a largely European virus-writing group called 29A. Members of the group have denied responsibility. ■

Verity adds enterprise search software

BY ANN SULLIVAN

SUNNYVALE, CALIF. — Verity's latest search software is designed to address the all-too-common challenge of trying to quickly get the right information to the right people.

What sets Verity's K2 Enterprise (K2E) software apart is that it includes search, classification and personalization features in a single package.

Designed to speed the delivery of data to business portal and intranet users, K2E searches portal content, organizes the data it discovers, and gets the data to end users by way of Verity's Social Networks personalization features. Social Networks link users and the documents they create, modify, access and search. Using this information, the software identifies "experts" within a company and connects

them to other end users. K2E will also recommend documents based on end users' browsing behavior and search criteria. For example, an engineer searching for a product's technical specifications may also locate the product's developers and relevant resources, according to Verity.

Typical search software for business portals has so far been a big disappointment, says Hadley Reynolds, director of research at Delphi Group. With K2E, Verity raises the bar for what's required of enterprise search software, he says.

While some functionality similar to that found in K2E is available from other information retrieval specialists such as Autonomy and Convera, or Web-focused search vendors Inktomi and Google, Verity is the first to package a range of search com-

ponents in a single distributed platform that's scalable for enterprise use, Reynolds says.

K2E runs on Windows NT/2000 and Sun Solaris. The software can be linked to third-party sources including Lotus Notes, Microsoft Exchange, Documentum's offerings and Open Database Connectivity-compliant databases.

Users of Verity's portal infrastructure software include AT&T, Cisco, Home Depot and Siemens. Deloitte Consulting, a Verity customer since 1998, is planning to implement K2E into its corporate portal so its 15,000 consultants can more easily make use of information contained in the company's 250,000 documents.

K2E began shipping this month. The average price is \$200,000.

Verity: www.verity.com

Corrections


The review "The LP200r packs a punch" (Aug. 6, page 41), should have stated the product's warranty is three years.

In the story "Experts call MPLS bad for 'Net'" (Aug. 6, page 1), a quote from Cisco Fellow Bruce Davie should have read: "I really think it comes down to a matter of philosophy. The people who worked on MPLS for a long time tried to solve practical problems. Other people say MPLS is a big deviation from pure Internet architecture [and] it should be stopped at all costs."

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CODE RED

The Code Red worm in all its variants continues its destructive spread. Share your experiences in our forum and get the latest Code Red news and resources with our breaking news page.



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Bandwidth with Brains

ISP touts turnkey CDN, streaming video packages

BY APRIL JACOBS

ISP Speedera Networks has announced a package of content delivery network and videostreaming services that the company will customize for service providers.

Called Fusion, the turnkey packages are designed to let service providers quickly add CDN and streaming to their existing portfolios. The idea, Speedera says, is to help providers deliver a CDN service to enterprise customers in days rather than months.

Speedera has already announced partnerships — with the likes of hosters Globix and MFN, as well as Hitachi net-Business and Wipro in Asia,



Philip Levinson, a general manager at Globix, says the company will offer CDN services using Speedera's Fusion technology.

and Ebone in Europe. The company also expects to have a deal for streaming in place with Exodus Communications in the near future.

Speedera, founded in 1999, is a privately held service provider with \$40 million in venture backing. The company counts Hewlett-Packard, Intel, Bank of America, Amazon.com and AT&T Wireless among its customers.

This announcement will put the company in direct competition with the likes of Akamai Technologies, Digital Island and Inktomi.

Speedera already offers its own CDN and Global Traffic Management and videostreaming services, but the Fusion offering is specifically designed to let other service providers buy, resell and customize those services for their own customers.

Service providers can offer CDN services using their own network backbones, as well as Speedera's if they need more reach and better performance. Speedera has about 100 points of presence in the U.S. and internationally, and access to about 100 carrier networks.

A key piece of Speedera's offering is its SpeedEye unified management interface, which lets end users view critical information about their CDNs' performance.

At Globix, SpeedEye technology has been refined and customized to provide Globix's users, 75% of whom are enterprise customers, with a new management tool called Earth-

View, which lets them view vital statistics about their CDNs.

Philip Levinson, vice president and general manager for Globix, says his company can now compete with other CDN providers and provide a single point of contact for its existing users, who already turn to it for caching content services.

The company will also offer streaming services for events such as live concerts, corporate meetings and training.

Speedera's Fusion offerings are available immediately. Prices vary depending on the performance requirements of providers.

Speedera: www.speedera.com

Cox,
continued from page 1

1,000 simultaneous VPN tunnels (see graphic).

The managed offering could help cable become a more viable remote communications option over rival DSL technology. According to a study the Federal Communications Commission released last week, more than seven million homes and businesses had access to high-speed Internet connections by the end of last year, a 63% increase in six months. Of that number, cable modems totaled 3.6 million and DSL lines totaled two million.

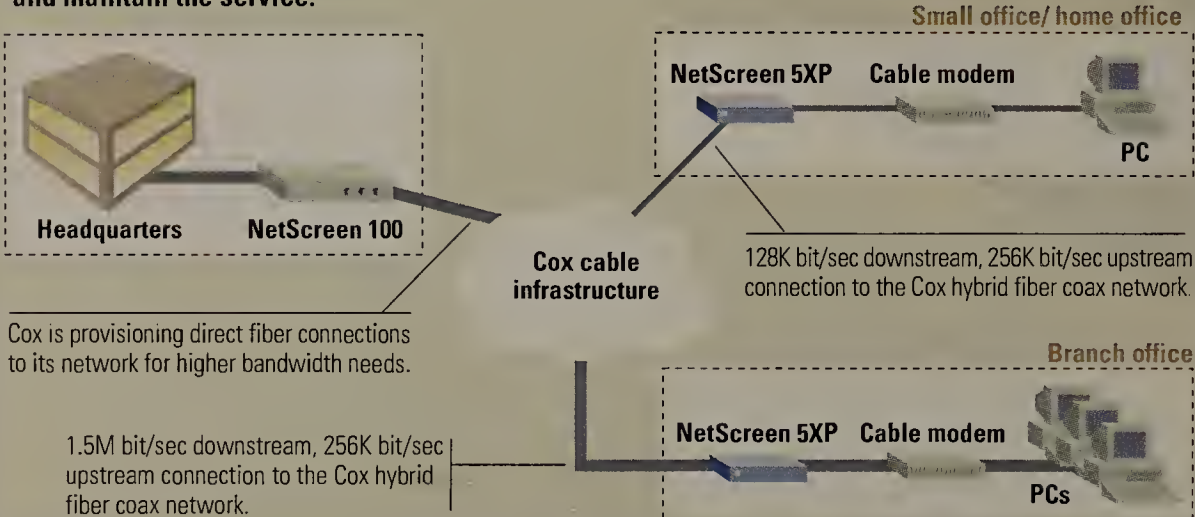
Perhaps the main benefit of the Cox service is that it lets users support high-speed, secure connections to their corporate network without breaking the bank.

Customers can choose from a variety of bandwidth options with Cox Business Internet Access service at their remote sites that range from 128K bit/sec downstream and 256K bit/sec upstream to 1.5M bit/sec downstream and 256K bit/sec upstream. The Cox Managed VPN with Business Internet Access services costs \$85 to \$250 per month per site.

Traditional managed VPN service options from companies such as AT&T, WorldCom, Genuity and Savvis typically include dedicated T-1 or fractional T-1 lines and dial-up access. T-1 or even a fractional T-1 to a residen-

Managed cable VPNs

Cox Business Services says its managed VPN offering can support up to 1,000 secure tunnels. Cox is deploying NetScreen devices at the edge of each user's network connection to manage and maintain the service.



tial home is too expensive for most users. A dedicated T-1 line costs between \$800 and \$1,000 per month. Dial-up is sufficient when on the road or working from home occasionally, but users handling large files on a regular basis would rather not be dependent on dial-up as their only means of connectivity. DSL is not offered as a managed VPN services by any carrier.

The service offers a cost-effective, fast VPN service option. Nebraska Methodist Health Systems (NMHS) says it is deploying the service for those reasons. "VPN support is a strategic part of our plans to remove geographic boundaries," says Doug Petry, network services manager at the healthcare sys-

tem, which includes two hospitals, a psychiatric facility, a university and medical offices in Omaha.

NMHS is setting up 120 employees from its transcription and billing departments with home offices that include a PC and a VPN connection. "We're doing this to retain employees and hire staff outside of the Omaha city limits," he says.

NMHS needed a VPN with high-bandwidth connections because its remote staff will work with large data and audio files. "Dial-up is way too slow for this type of traffic," he says. For privacy reasons, the company also needs guaranteed security.

On the downside, Cox's ser-

vice is not available nationwide. The 21 markets it will serve include Baton Rouge, La.; Connecticut; Fairfax, Va.; Hampton Roads, Va.; Lubbock, Texas; Las Vegas; Macon, Ga.; New Orleans; Oklahoma City; Omaha; Orange County, Calif.; Palos Verdes, Calif.; Pensacola, Fla.; Phoenix; Tucson, Ariz.; Rhode Island; Roanoke, Va.; San Diego; Santa Barbara, Calif.; Tulsa, Okla.; and Wichita, Kan. The company plans to expand, but has no schedule.

Petry says he will have to supplement his employees with DSL services, but he hopes Cox will work out deals with other service providers so the cable company can also manage those connections.

Another initial drawback is that Cox is not including a standard service-level agreement (SLA) with its service. "I'm drafting my SLA now including our long-term needs along with what we're using the service for today," Petry says.

While Cox will be the only service provider offering a fully managed VPN service over its cable network, competitors have plans of their own.

RoadRunner is testing a "few" VPN services using IPSec, says Jason Welz, director of commercial services at Cox. RoadRunner is in the process of deciding whether it will support a managed VPN offer in-house or if it would make sense to turn that management over to a third party.

While AT&T Broadband is not offering a VPN service to its customers, AT&T proper lets users connect to its VPN customers' networks using cable modem or DSL services from a different service provider. But these connections are not managed or guaranteed by AT&T.

Comcast lets its Broadband Commuter users set up their own VPNs using this business-class service, but Comcast does not manage the security devices for its customers. Users provide those devices themselves.

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VOICE, DATA AND WEB FOR BUSINESS

Security is top worry among IBM users, survey says

Poll by large IBM user group Share reflects company concerns about setting up e-commerce sites.

BY KATHLEEN OHLSON

CHICAGO — In the wake of tying their computer systems closer to those of business partners, IBM users now have heightened concerns about protecting sensitive data on their networks.

According to a soon-to-be released survey of IBM customers, security ranked as the top issue confronting them, up from the fifth most important issue a year ago.

The Share organization, an independent voluntary association of about 2,000 IBM users from large companies and educational institutions, turns over the results of its annual survey

IBM 2001 user survey

Members of the IBM user group Share say security — their fifth-biggest concern last year — is now issue No. 1.

2000

1. Internet presence
2. OS/390 directions and products
3. Enterprise application integration
4. Mainframes and enterprise servers
5. Enterprisewide security

SOURCE: SHARE SURVEY

2001

1. Protecting sensitive data/resources
2. Business-to-customer commerce
3. Competitive advantage
4. Core services
5. Availability of critical applications

to IBM in hopes the company will take the data into account in future products.

Last year, the top concern for Share members was getting an Internet presence, but e-com-

merce dropped to the second most important issue in this year's survey.

"Someone might view this [year's survey] as a dramatic change of results, but it reflects

what's going on in general" with businesses, says Pam Taylor, Share's director of industry relations. "E-commerce is opening up businesses electronically and there's a lot of issues ... businesses have to face, such as how to deploy their own sensitive data while protecting it and exchanging it with customers, suppliers and vendors."

One reason security is such a big concern is that companies generally budget just enough for security technologies to get by, says Randy Mowen, director of data management and e-business architecture for Bekins, a Hillside, Ill., moving and storage company. But things can get risky when it comes to mak-

ing unplanned security-related purchases in response to new threats, he adds.

Taylor says this year's findings point out that application development and deployment are "high on the minds" of IS and network executives.

IBM customers are struggling over whether to build or buy their applications — or whether to rent them from an application service provider, he says.

Other concerns confronting Big Blue customers include training and retention; the shortage of IT professionals and complying with regulatory privacy requirements.

Share: www.share.org

Buyers,

continued from page 1

price war with rival Advanced Micro Devices, which could produce a ripple of lower hardware prices.

● A pledge from storage giant EMC, which has long prided itself on commanding premium prices, that it now won't be beaten routinely on cost. "The credo for our salesforce is 'You are not allowed to lose a deal on price without my permission,'" Frank Hauck, executive vice president of global sales and services for EMC, recently told analysts. The company has cut its prices on support and equipment maintenance by 10% for

prepay orders.

● News that Hewlett-Packard is slashing prices on Xeon Net-servers, offering trade-in incentives, and a "buy four get one-free" deal.

Oceanside's Sherwood says he is seeing all sorts of vendor concessions.

"There are offers of free engineering and free on-site installations," he says, adding that hardware is now being guaranteed for delivery seven days after purchase instead of the typical 30 days or more. He says Compaq and Dell have vowed not to let the other win a deal on price.

Sherwood says his IT budget has been slashed by 15%, but he has seen prices on some products drop by up to 45%. Analysts say prices on servers are down 15% to 20%. In the PC market, where manufacturers are trying to work through a large backlog of inventory, prices are also down 15% to 20%.

"Without the economic downturn, our budget cuts would have forced us to buy hardware that met only our minimum specifications," he says. "Now we can buy above spec and guarantee the equipment will last three years instead of just one."

Travis Berkley, supervisor of LAN support services at the University of Kansas, says he is seeing a \$300 to \$400 discount on Dell hardware. "It means we are getting more bang for our buck, that's for sure."

Deal cutters

Here are a few things IT executives should keep in mind as they try to find deals in a struggling economy.

- Pit high-quality competitors that meet the end-user's requirements against each other ... and tell them that price counts.
- Use the aggressive competition to do some buying ahead of real need.
- Look harder at what you really need, now that you have the time.
- Don't make snap decisions.
- Front-end the decision-making process. Look at overall network goals.

While the hardware market may be rife with price wars, IT executives and analysts report few deals on software and services.

"The pressure we feel is customers delaying software projects based on their own budget concerns; it's not a price pressure," says Scott Silk, senior vice president of marketing and business development for integrator ePresence.

In telecommunications, used equipment for enterprises and service providers is available for pennies on the dollar, says Lisa Pierce, director of telecom services at Giga Information Group and a *Network World* columnist. But, she says, the cost for services such as voice is already at rock bottom.

There are also other deals out there.

"I've seen some Web consulting services vendors decrease their prices dramatically to get

the business," says Rocco Esposito, CTO for window-covering manufacturer Hunter Douglas in Upper Saddle River, N.J. Although Esposito would not name the vendors, he says in general, "they are all getting a little more desperate."

Still, most of the dealing is in the hardware market.

Chip Goodall, senior business analyst for Carlson Shared Services in Minneapolis, says he's received up to 10% discounts on servers and is hoping for better deals based on HP's announcement. "We will be looking to take advantage of that because management is scrutinizing every purchase," he says.

Such is the case throughout IT departments these days.

"The fact that most IT spending has slowed gives the IT manager a chance to look harder at everything," says Tony Prigmore, an analyst with Enterprise Stor-

age Group. "A year ago, the rate of change in infrastructure didn't give them breathing room to look at other alternatives."

But some users say drops in pricing can have negative effects.

"The cheaper prices are making companies get rid of the tech support they had even last year," says Michael McKenney, IS manager for Americorp Financial in Birmingham, Mich. He cites repeated busy signals and two-hour holds on recent tech support calls with Computer Associates, Symantec and Novell.

And McKenney says the price cuts aren't helping his budget because the bean counters are getting wise. "The cheaper costs are cutting the budget because accounting keeps track of the purchases," he says.

Predictions on how long the economic downturn will last are mixed. Last week, Cisco CEO John Chambers said things have yet to hit bottom and may get worse. Others predict things will begin to pick up early next year.

"A year ago it was the vendors doing all the talking; now the vendors are doing all the listening," says Ron Herardian, CEO of Global Systems Services, a software consulting company. ■

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Cisco,
continued from page 1

CEO John Chambers told Wall Street analysts last week. Indeed, the next three to six months may be the worst yet.

"No one really knows when the economy or capital spending will bottom out," Chambers said, adding that it may occur in the next two quarters. "It may get worse before it gets better."

Cisco's fourth quarter, which ended July 28, was in line with analyst expectations: sales down 25% from last year's fourth quarter, and 9% from last quarter; with earnings down 99% from last year. Sales were up 18% for the full fiscal year, but Cisco recorded a \$1 billion loss.

"This has been the most challenging year in Cisco's, and possibly the industry's, history," Chambers says.

Numbers aside, everyone wanted to know if Cisco would offer any indication that the industry is emerging from a nine-month slump.



"Cisco is just in line with the rest of world right now," says Rock Regan, CIO for the state of Connecticut, a Cisco customer. "The economy has been pretty sluggish; it's affecting everyone."

Regan hopes the slump doesn't hurt Cisco's ability to develop new products.

"If things continue to get worse, there will be a slowdown in the technology development pace," he says. "A slowdown would probably mean that some of the things [Cisco is] working on will take much longer to develop."

Regan says he has not felt any ripples from Cisco's woes. After Cisco announced

"We're seeing design wins, but not revenue [in optical]."

Mike Volpi, chief strategy officer, Cisco

liked this quarter," says Mike Volpi, Cisco's chief strategy officer. They include optical, mobile wireless and content networking, he says.

Optical update

In optical, Cisco will not meet its billion-dollar projections due to reduced spending and lengthy sales cycles for "dramatic" product upgrades from OC-48 to OC-192.

"It's a tremendous upgrade in bandwidth but the spending is not there," Volpi says. "We're seeing design wins but not revenue."

Cisco's experience with optical is indicative of what's happening in the industry. Dell'Oro Group says spending for optical transport gear will decrease 23% this year, after growing 49% in 1999 and another 49% in 2000.

Mobile 3G wireless is taking off slower than Cisco had hoped, although the wireless LAN market is developing faster than expected, Volpi says. And in content networking, a shift is occurring where switches intended for Web-hosting centers are slowly finding their way into the enterprise, he says.

Blockbuster markets take two to three years to develop, and Volpi is confident that the current laggards will be leaders within that time.

Conservative marketing

Analysts say Cisco is becoming more conservative in its marketing during the current slump, a trend they say may prove costly in the long run.

"The company is still a relative newcomer in communications equipment, including optical systems and data networking for 3G wireless infrastructures," says Bill Lesieur of Technology Business Research in Hampton, N.H.

"The company now needs to build defendable market positions, which will likely

require some sacrifice of profitability. If Cisco becomes too conservative in expanding into the communications equipment markets during the next 12 months, the company is at risk of not achieving its long-term objectives as the industry consolidates around Cisco, leaving it primarily an enterprise and IP router player," he says.

This is not such a bad thing, according to Lawrence Orans, a Gartner analyst. Despite its poor performance in terms of earnings and stock price, Cisco is still in good shape compared to rivals in the enterprise switching markets, Orans says.

Nortel has been too complacent as a No. 2 in the enterprise market, he says. And Foundry has been so aggressive in chasing the service provider market, it has left behind golden enterprise opportunities such as VPNs, security and IP telephony.

Indeed, those three markets are growing well during the slump, according to Volpi.

Cisco is still capturing enterprise market share from all but Enterasys, Orans says. Enterasys has kept pace with Cisco in VPNs, Gigabit Ethernet switches and intrusion-detection products, he says.

And the enterprise market may hold the key to recovery for Cisco and the industry. After falling for the past few quarters, Cisco's enterprise orders leveled off in the fourth quarter.

While Cisco's slowdown on acquisition spending has been notable, Orans doesn't think this will affect the company's ability to innovate.

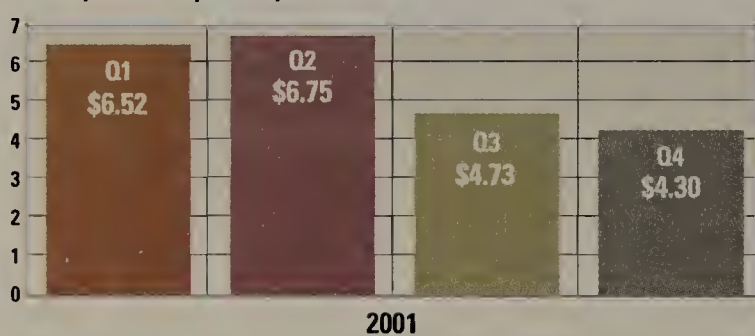
"Cisco will be smarter in terms of [its] acquisitions," Orans says.

"They'll be looking to buy companies with products that are further along in their development stage, rather than making bets on companies to acquire certain [research and development] talent or products that are based on blueprints," he says. ■

Cisco's earnings slump

Cisco's fortunes took a steep drop in the just-ended fiscal year.

Fiscal year 2001 quarterly revenue (in billions)



SOURCE: CISCO

Although Cisco did not discuss expectations beyond the current quarter, what it offered was not pretty: results will be flat or down 5% from fourth-quarter 2001.

Better times ahead, some analysts say

Nonetheless, some analysts say better days are near for Cisco and the economy.

"We believe the worst is behind the company and the U.S. has already begun to recover," says Nikos Theodosopoulos of UBS Warburg. "But it's going to take a while."

Customers say Cisco's results mirror the state of the industry.

layoffs in March, some of the Cisco salespeople he'd been working with on a \$3 million data center upgrade project for the state were let go. The changes didn't affect the project, he says, adding "we haven't missed a beat with Cisco since."

Cisco itself has had a rougher time. In the fourth quarter, a handful of the company's so-called tornado markets — those said to have the potential to disrupt the technological status quo and reap billions for the vendor — were downgraded to, in essence, tropical storm ... or less.

"Some are not tornadoing as much as we would have

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5. What is the total number of Servers/Clients installed/planned at your location/in your entire organization? (check ONE box in each column)

SERVERS		CLIENTS	
At Location	Entire Org.	At Location	Entire Org.
A	B	C	D
<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>
<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>
<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>
<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>
<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>
<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>
<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>
<input type="checkbox"/> 8. None	<input type="checkbox"/>	<input type="checkbox"/> 8. None	<input type="checkbox"/>

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check ONE only)		B. Involvement (check ALL that apply)	
CORPORATE/ENTERPRISE:		1. <input type="checkbox"/> Create Network/IT Strategy	
1. <input type="checkbox"/> Entire Enterprise/Multiple Enterprises	3. <input type="checkbox"/> Division/Multiple Divisions	4. <input type="checkbox"/> Evaluate Products/Services	
2. <input type="checkbox"/> Multinational Enterprise	4. <input type="checkbox"/> Department	5. <input type="checkbox"/> Determine the Need	
	5. <input type="checkbox"/> None	6. <input type="checkbox"/> None	
		3. <input type="checkbox"/> Approve Purchase	

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7. What is the estimated number of employees in your entire organization/at your location? (check ONE in each section)

A. Entire organization:		B. At your location:	
1. <input type="checkbox"/> Over 20,000	5. <input type="checkbox"/> 1,000 - 2,499	1. <input type="checkbox"/> Over 20,000	6. <input type="checkbox"/> 500 - 999
2. <input type="checkbox"/> 10,000 - 19,999	6. <input type="checkbox"/> 500 - 999	2. <input type="checkbox"/> 10,000 - 19,999	7. <input type="checkbox"/> 250 - 499
3. <input type="checkbox"/> 5,000 - 9,999	7. <input type="checkbox"/> 499 or less	3. <input type="checkbox"/> 5,000 - 9,999	8. <input type="checkbox"/> 100 - 249
4. <input type="checkbox"/> 2,500 - 4,999		4. <input type="checkbox"/> 2,500 - 4,999	9. <input type="checkbox"/> 99 or less
		5. <input type="checkbox"/> 1,000 - 2,499	

11. Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Servers		B - Workstations/Desktops/Laptops	
1. <input type="checkbox"/> IBM (Mainframes)	5. <input type="checkbox"/> Unisys	1. <input type="checkbox"/> Sun Microsystems	5. <input type="checkbox"/> Dell
2. <input type="checkbox"/> IBM RS/6000	6. <input type="checkbox"/> H-P	2. <input type="checkbox"/> H-P	6. <input type="checkbox"/> Gateway
3. <input type="checkbox"/> IBM AS/400	7. <input type="checkbox"/> Other	3. <input type="checkbox"/> Compaq/Digital	7. <input type="checkbox"/> Fujitsu
4. <input type="checkbox"/> Compaq/Digital/Tandem		4. <input type="checkbox"/> IBM	8. <input type="checkbox"/> Other

12. What is the estimated gross revenue of your entire company/institution? (check ONE only)

1. <input type="checkbox"/> \$20 Billion or More	5. <input type="checkbox"/> \$100 Million to \$499.9 Million	9. <input type="checkbox"/> \$4.9 Million or Less
2. <input type="checkbox"/> \$10 Billion to \$19.9 Billion	6. <input type="checkbox"/> \$50 Million to \$99.9 Million	10. <input type="checkbox"/> None of the above
3. <input type="checkbox"/> \$1 Billion to \$9.9 Billion	7. <input type="checkbox"/> \$10 Million to \$49.9 Million	
4. <input type="checkbox"/> \$500 Million to \$999.9 Million	8. <input type="checkbox"/> \$5 Million to \$9.9 Million	

13. For which areas outside of the U.S.A. do you have purchase influence? (check ALL that apply)

1. <input type="checkbox"/> Europe	3. <input type="checkbox"/> South America	5. <input type="checkbox"/> Middle East	7. <input type="checkbox"/> Canada
2. <input type="checkbox"/> Asia	4. <input type="checkbox"/> Australia	6. <input type="checkbox"/> Africa	8. <input type="checkbox"/> None

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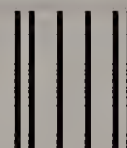
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TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage

Briefs

WQuinn next month is expected to release a new version of its storage resource management software. The company's **Storage-Central Storage Resource Management (SRM) 5.0**, now in beta, includes new features such as an enhanced user interface that makes it easier to configure and set policies, and the ability to do remote reports. WQuinn's SRM 5.0 now lets IT departments charge for disk usage by department, location, division or workgroup. It also conforms to Microsoft's Management Console, which simplifies navigation. In addition, reporting in SRM 5.0 has been reorganized, making it easier for users to find specific information. The software now supports drill-down reporting, letting users probe further into summary reports. SRM 5.0 also can clean up files and directories automatically if requested by a policy. SRM 5.0 is priced at \$1,300 for Windows NT/2000 or Advanced Server, and \$5,000 for Win 2000 Data Center Server.

WQuinn: www.wquinn.com

Storage infrastructure vendor **Crossroads Systems** last week launched a new generation of Fibre Channel to SCSI routers. The **Crossroads 8000 Storage Router** has two Fibre Channel and eight SCSI Ultra/160 ports for connection to SCSI-based hosts and Fibre Channel storage arrays. It also contains dual power supplies and fans, as well as a 10/100M bit/sec Ethernet port and a serial port for remote management. The company ships the Crossroads Visual Manager (CVM) software with the 8000. CVM allows the browser-based management of the router via either a 10/100 Ethernet-based port or command-line management via a serial interface. The Crossroads 8000 sells for \$19,000 and is available now.

Crossroads: www.crossroads.com

IN-SITE: *Lessons from Leading Users*

Bank taps Siemens for tricky VoIP rollout

BY PHIL HOCHMUTH

Jay Patterson knew he could save his company, United Bank and Trust, at least \$43,000 per year by connecting its branch offices over a single IP voice network — but he also knew it would be no easy task.

The Tecumseh, Mich., bank needed a new phone system, but most of UBAT's customer data and critical applications still resided on IPX-based NetWare servers. While the firm was migrating from NetWare to IP-based Windows 2000, it wasn't ready to install IP voice, throw out IPX and upgrade to Win 2000 all at once, says Patterson, UBAT's network administration officer.

The motivation for connecting the offices with voice over IP was the hefty cost UBAT was paying for off-premise service (OPS) lines from the phone company, used to tie together separate Nortel PBX and key systems in each office.

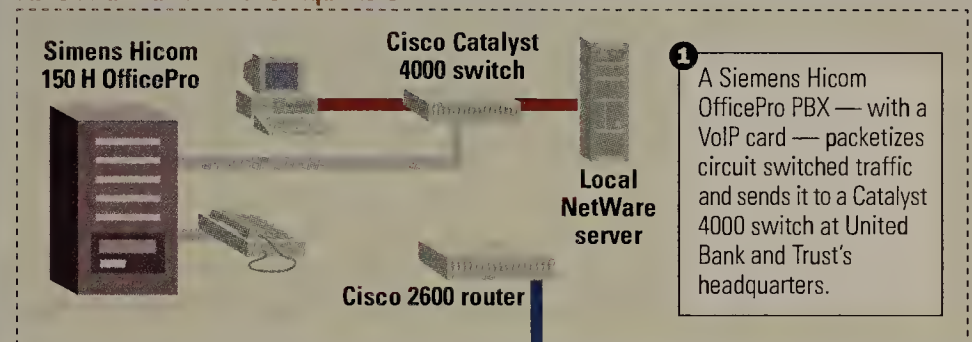
"We run with about 40 OPS lines from the phone company," which connect UBAT's 220 employees in 15 branch offices and its headquarters, Patterson says. "The monthly cost on those things would run anywhere from \$100 up to over \$300 per piece per month."

See **Siemens**, page 18

Double-barreled voice

United Bank and Trust wanted to connect its 16 branch-office PBXs over IP, while maintaining the NetWare 4.1, IPX-based LAN at each site and headquarters.

United Bank and Trust headquarters

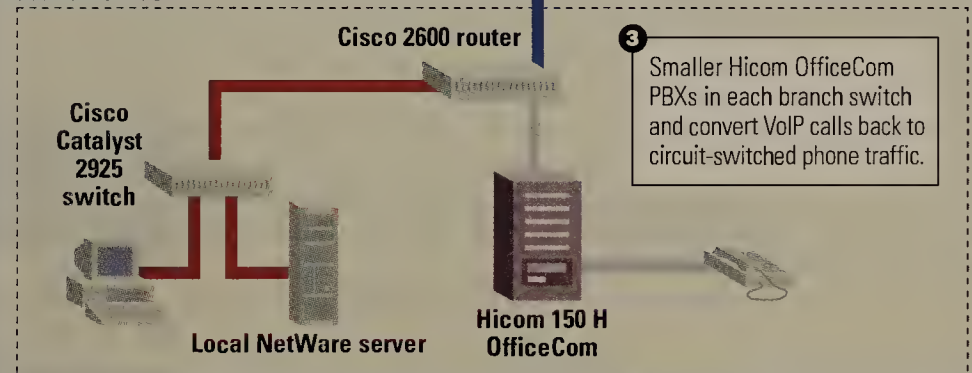


2 Cisco IOS software on the switch and router prioritizes IP voice and the IPX LAN traffic and sends the voice and data over the bank's Verizon/Ameritech frame relay network.

Frame relay (256K-1.5M bit/sec)

IP
IPX

Branch Office



EMC software boosts storage options

BY DENI CONNOR

HOPKINTON, MASS. — Enterprise IT managers can now choose to back up and restore data from their EMC Symmetrix storage arrays over a Gigabit Ethernet or Fibre Channel-based network with software available from the storage giant.

The company's EMC Data Manager (EDM) back-up software now lets users perform simultaneous backups of Microsoft Common Internet File System or Unix Network File System files and choose whether the data destined for storage takes a more efficient path over the Ethernet network or storage-

area network (SAN).

In traditional back-up operations, the server initiates backup of data over the network between storage devices and the tape library. In serverless backup, the data move between the storage array and the tape library directly, eliminating the intervention of the server and saving on CPU cycles. LAN-free backup occurs primarily in SAN environments where the movement of data is initiated by the server from the storage device to the tape library, avoiding the network and saving bandwidth.

EDM, a hardware and software combination, See **EMC**, page 18

www.nwfusion.com

GAINING GROUND?

Read why analysts believe EMC rivals are turning up the heat on the storage giant. Check out our related links for the latest storage news.

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Wired Windows . Dave Kearns

THE TOWER OF BABML

In the Bible's Book of Genesis, it is told that when men tried to build a tower which would "reach unto heaven," God confounded them by making them speak different languages so that they would not understand one another.

Recently, in visits to meetings of the Directory Interoperability Forum, the Directory Services Markup Language (DSML) group and The Burton Group's Catalyst Conference I found evidence that the confounding may still be going on.

XML has been hailed as the "common speech" that will, finally, enable a truly Internet-based economy to take hold. XML is easily parsed by programs, human readable, infinitely extensible and has enough "meta" (that is, self-describing) characteristics to be adaptable to multiple cir-

cumstances. It sounds like a salvation for the dot-com economy, doesn't it?

Of course, the very extensibility of XML and its ease of use mean that its "vocabulary" continues to grow. To better adapt it to particular uses, then, committees are created to approve a particular vocabulary and syntax for particular vertical and horizontal markets. To make sure we all agree on a particular implementation, these committees are attached to international standards groups. If only there were a standards group that acted as a clearinghouse for the creation of standards groups!

Evidently the Organization for the Advancement of Structured Information Standards (OASIS), which wants to be the chief XML standards body, and the Internet Engineering Task Force (IETF), which has always been the stan-

dards group for the Internet, have both sponsored groups wishing to "XML-ize" the Lightweight Directory Access Protocol. OASIS sponsors DSML, while the IETF sponsors a group working on something called XDAP. Both groups worked for more than a year without knowing about the other's existence!

In addition to these two groups working to bring XML to directory services, almost all vertically integrated XML-standards-designing groups include "directory" or "registry" information so that their users and applications can store and recall data.

The problem, of course, is that all the benefit of defining a limited vocabulary is lost because all the vocabularies are different. The Tower of XML we thought we were building has turned into the silos of XML — leaving us not a whole lot

better off. But it isn't too late to change that.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.



Novell's new iFolder technology delivers on the promise of Microsoft's Briefcase tool more easily, more effectively and more securely. Visit <http://ifolderdemo.novell.com> to try it out for yourself!

Siemens,
continued from page 17

Another reason to go with voice over IP, Patterson says, was the fact that the Meridian PBX and branch-office key systems the company had were hard to administer, often requiring a \$300 visit from a service technician to make changes on the system's cryptic, terminal-based interface. Also, users couldn't transfer outside calls to other branch locations over the OPS lines that connected the offices.

for its headquarters and the smaller OfficeCom for the branches. The boxes were installed with Siemens' CorNet IP software and hardware, which lets the PBX packetize voice and signaling traffic and send it to an IP network.

"Siemens told us they'd rather we don't have IPX," Patterson says, but the Siemens equipment, with a dash of technology from Cisco added, now works well with the NetWare LAN.

Although UBAT passed on

the new Siemens equipment, all the phones were upgraded to new Siemens digital phones. The phones were still far less expensive than Cisco IP phones (\$150 vs. \$700) and provided features such as caller ID and voice mail message indicators that their old phones lacked.

Patterson says a Windows-based administration tool makes adds, moves and changes easier. The fact that Hicom gear is manageable by SNMP is also valuable, he adds.

When UBAT began to go live with the Siemens equipment, the anticipated long-distance savings the bank was counting on became real.

"All we had to do was upgrade some of the [frame relay] connection speeds and just turn all those OPS lines off in one month," Patterson says.

With the three network technologies — IP, IPX and time-division multiplexer — now working together, UBAT expects to save at least \$43,000 per year. The network also made the transition to Windows less painful.

"The nice thing about the Siemens offering is that we are still running IPX," Patterson says. "We didn't have to retire the NetWare 4 at the same time we're putting in voice over IP, and at the same time we're putting in [Win] 2000. We're still weaning off of [IPX], but it was great that we didn't have to do it all at once." ■

EMC,
continued from page 17

nation that runs on a Sun server, works with EMC's Celerra HighRoad file system.

HighRoad software is installed on the Celerra network-attached storage (NAS) device



EMC's Celerra box supports LAN- and server-free back-up technology.

and off-loads the file server CPU of the I/O processing, thus facilitating serverless backup. The Celerra SE File Server, which connects to the 10/100M bit/sec Ethernet network, also attaches to the EMC Symmetrix storage array.

EDM can be configured to

allow serverless or LAN-free backup for operating system environments, including Windows NT, NetWare, IBM OS/2.

Market research firm IDC says serverless and LAN-free backup are primary reasons to implement SANs.

"You want to get the load of back-up operations off of the hosts so they can do real work," says Bill North, an analyst with IDC. "Finding a way to become serverless or LAN-free with a SAN in your back-up environment is a good thing."

Multiple Celerra NAS systems can be backed up to a shared tape library, which is included in the cost of EDM, thus lowering the cost of equipment acquisition.

EMC's serverless and LAN-free backup competes with software from Veritas, Network Appliance, IBM, Hewlett-Packard and Hitachi Data Systems.

Observers say EMC's HighRoad is one of the first software packages that determines whether backup should occur over NAS or SAN devices on NT and Unix networks.

EDM starts at \$300,000, including the Sun server and the tape library; Celerra HighRoad starts at \$15,000; the Celerra Network Attached File Server starts at \$100,000. The Symmetrix storage arrays start at \$100,000. All products are available now.

EMC: www.emc.com

■ "Nortel and Cisco said, 'Don't even try [voice over IP] with IPX.' "

Jay Patterson, network administration officer, United Bank and Trust

The bank considered a few Nortel offerings, including an IP-enabled PBX and a Windows server-based system. The firm tested an all-IP system (IP phones and a Call Manager server) from Cisco in two of its offices, but found that the equipment was too expensive. The sticking point with both vendors was the bank's requirement for IPX in the LAN.

"Nortel and Cisco said, 'Don't even try [voice over IP] with IPX,'" Patterson says.

The bank chose midsize and small-office PBXs from Siemens — the Hicom 150 H OfficePro

Cisco voice-over-IP gear, the bank did upgrade its hubs and routers to Cisco 2600-series routers and Cisco Catalyst 4000 and 2924 switches. The Cisco gear is vital to the network for its ability to "trunk" the voice traffic as a separate, prioritized data flow from the IPX LAN traffic (802.1Q packet tagging through Cisco's IOS software is used to do this). The trunking ensures interoffice voice packets are routed and switched the fastest while IPX LAN traffic is switched at a lower priority.

While the bank could have kept its old Nortel phones with

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Buy it for \$3469*

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18GB Pluggable Ultra3 SCSI hard drive³

256MB PC 133MHz ECC SDRAM (exp. to 6GB³)

5U⁴ form factor (Tower available)

Dual processor capable

3/3/3 parts, labor, and on-site warranty⁵

Optional Upgrades: On-line spare memory, redundant hot plug fans, hot plug PCI and power supply



ProLiant DL380 Server

\$131 per month¹

\$0 down, 0% lease for up to 30 months²

Buy it for \$3919*

QuickAccess Code: N8X813-16754

Intel Pentium III processor 1.13GHz, 512K cache

18GB Pluggable Ultra3 SCSI hard drive³

256MB PC 133MHz ECC SDRAM (exp. to 6GB³)

2U⁴ form factor

Dual processor capable

3/3/3 parts, labor, and on-site warranty⁵

Optional Upgrades: On-line spare memory, redundant hot plug fans, hot plug PCI and power supply



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Net.Worker

Products, services and strategies for tying teleworkers to the enterprise

Briefs

The number of U.S. remote offices is expected to swell from three million today to five million by 2005, according to a report from Cahners In-Stat. The report finds remote workers are increasing demand for broadband services and equipment across all business sectors, which in turn is putting significant strain on IT.

Agere Systems' update to its ORiNOCO installation software touts a wizard-based install for network novices, but also includes management features that warrant the free upgrade. Mobile users can create configuration profiles for up to 99 network locations, and IT managers can set up and manage their teleworkers' ORiNOCO Residential Gateways remotely. There is also added roaming capability and enhanced Wired Equivalent Privacy security. ORiNOCO: www.orinocowireless.com

Managejobs released Version 1.2 of its online project and client management service for small firms and independent professionals. Managejobs lets users streamline project administration, organize business data, generate legal contracts, manage timelines and consolidate billing. New features are integration with Quicken and AvantGo, 10 new contract templates and the ability to create your own.

Managejobs: www.managejobs.com

Mangosoft released Version 2.0 of its Mangomind Internet file sharing and online storage service. The new "pinning" feature automatically updates files and folders and saves them in the PC's cache so the newest versions are always available offline.

Mangosoft: www.mangosoft.com

Shopping with peripheral vision

BY STEVE JANSS

Printers, scanners, fax machines, CD-R/RW drives, monitors — what do all these have in common, other than they're computer peripherals?

They can also be a royal headache, especially if you're using the wrong equipment. Your teleworkers' needs differ from those of your typical employee, whose access to workgroup faxes and printers is a given. Teleworkers' duties may differ as well and may require specialized equipment.

Choosing the wrong equipment can double a system's price or even halve your teleworkers' productivity.

Separate styles

Thinking of buying a multifunction scanner/printer/fax? If your needs are light and you're willing to accept that a breakdown in one component may affect them all, go ahead. However, if you rely heavily on a laser printer or fax machine for daily activities consider buying separate devices.

The OfficeJet v40xi (\$250) and the LaserJet 3200se (\$600) are two good print/fax/san/copy choices from Hewlett-Packard. Scanner-hounds should take a good look at Canon's CanoScan N1220U (\$200). If you're in need of a serious printer, check out Lexmark's T520 (\$700) for monochrome or the C720 (\$2,100) for color.

TELEWORKING TOP 10

An ongoing series designed to help set up your teleworkers for their small-office or home-office networks.

PART 8

Surround yourself with sound

With the rise of Internet telephony, your teleworkers will need a good sound card to use their computers to answer voice calls. I've found Creative Labs' SoundBlaster Live Value delivers the best sound at a good price.

The card has a digital output for clear sound when driving the two- or four-speaker Cambridge Soundworks Digital speakers and subwoofer. The card also has analog front and rear speaker outputs, so you can use a less expensive pair of speakers. When combined with an HS1 noise-canceling headset from Plantronics (\$27, retail), your teleworkers will enjoy Internet telephony and high-fidelity stereo sound.

Visual acuity

Not all flat square tubes are flat — some, such as my Samsung SyncMaster 1100P, sport a slight curve. Even so, I've yet to see a LCD monitor come close to its resolution and contrast. But which is right for you — CRT or LCD? For com-

parison, let's consider two similarly priced monitors from Samsung.

The SyncMaster 770TFT 17-inch LCD monitor (around \$850) has a resolution of 1280 by 1024 at 76 Hz, a pixel size of .264mm, a brightness of 170 candelas per square meter, and a contrast ratio of 200-to-1. The SyncMaster 1200NF "Natural Flat" CRT monitor (\$780) has a 22-inch screen (20 inches viewable) with a resolution of 2048 by 1536 at 75Hz, and a pixel size of .24mm.

The CRT provides 10% greater pixel resolution, 140% greater resolution overall, and better brightness and contrast than its LCD cousin. Both monitors share the same maximum viewable image size (406.4mm by 304.8mm), but the CRT 1200NF costs \$70 less. The big advantage of a LCD is that it weighs a lot less and takes up less space.

If portability is a factor or you really need the space, take advantage of recent price reductions on LCD monitors. Otherwise, you'll probably be happier with a flat-screen CRT.

Connection inspection

Before buying any peripheral, think about how you want to connect it. There are currently eight common connection protocols on the market (see graphic).

With so many competing standards, what type of connection should you use for each peripheral?

First, skip USB for keyboards and mice — if your operating system ever burps, they're useless. Use the old PS2 ports instead. For scanners and digital cameras, USB is better. Firewire is the standard for digital video and can also be used for external hard drives, which is great if you need a portable, high-speed hard disk drive. Use SCSI-2 or SCSI-3 for your servers, and Fibre Channel for your server farms. Bluetooth is a good solution for connecting PDAs or when you need a portable keyboard/mouse combo that's physically separated from the computer. Finally, if you've got a laptop, chances are it has an IrDA port that you can use with many similarly equipped printers and other laptops.

Next story: Ergo, therefore, I am (ergonomic considerations for teleworkers).

Janss is president of Jansys Information Systems, a consulting firm specializing in IS technologies for small businesses. He can be reached at bizcom@jansys.com.

Peripheral connections made easy

Not sure how all those device interfaces stack up? Check out our chart.

Common name	Used by	Speed
IEEE 1284/ECP/EPP Parallel	Printers	500K to 2M byte/sec
RS 232c Serial Cable	External modems	115K byte/sec
IEEE 1394 Firewire/i.LINK	Digital video/external hard drives	50M byte/sec per device, 400M byte/sec per cable
SCSI-2 ("plain SCSI")	Internal/external hard drives/scanners	5M to 10M byte/sec
Ultra-2 SCSI	Internal/external hard drives	40M byte/sec
Ultra-3 SCSI (Ultra/160m)	Internal/external hard drives/server farms	160M byte/sec
Ultra ATA/100	Internal hard drives	100M byte/sec
ISO 1496-1 Fibre Channel	Server farms	1G byte/sec
Bluetooth	PDAs, printers	1M byte/sec (2M byte/sec in 2nd Generation)
USB	Scanners, digital cameras, joysticks	12M byte/sec
IrDA	Printers, laptops, cameras	4M byte/sec (IrDA 1.1)

Find the expanded version of this chart online. See www.nwfusion.com, DocFinder: 5535

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Carriers & ISPs

The Internet, Extranets, Interexchange
and Local Carriers, Wireless, Regulatory Affairs

Briefs

Nextel Communications announced last week it is expanding the geographic reach of its two-way radio feature called **Direct Connect**. The service provider will let its wireless telephone service customers use the two-way radio feature outside their local calling areas. This feature lets users quickly contact others without making a telephone call. The feature is similar to a walkie-talkie, but with much greater range. It will be available nationwide by year-end 2002, Nextel says.

Micron Electronics has completed its acquisition of **Interland** and is merging its **HostPro** subsidiary with the managed Web hosting firm. With last week's acquisition, Micron Electronics changes its name to **Interland** and moves its headquarters to Atlanta, where Interland is based. Together, HostPro and Interland, which both focus on small and midsize businesses, have six data centers, serve about 130,000 customers and host more than 230,000 Web sites.

Metro Ethernet service provider **IntelliSpace** last week unveiled a program that provides a back-up Internet service for the customers of troubled ISPs. Called the **Internet Insurance Program**, IntelliSpace's service involves IntelliSpace wiring a company's site for a secondary Internet connection. Customers would pay for the cost of the wiring, but would not pay for any Internet service unless the line was activated. IntelliSpace provides data connections to business customers through Ethernet and traditional links in 15 markets in the U.S. and Europe.

IntelliSpace: www.intellispace.net

Furniture maker turns to convergence

BY LINDA LEUNG

Steelcase takes pride in the technology it puts into its office furniture design — particularly ergonomic chairs. Now the company is also moving to the cutting edge for its internal network.

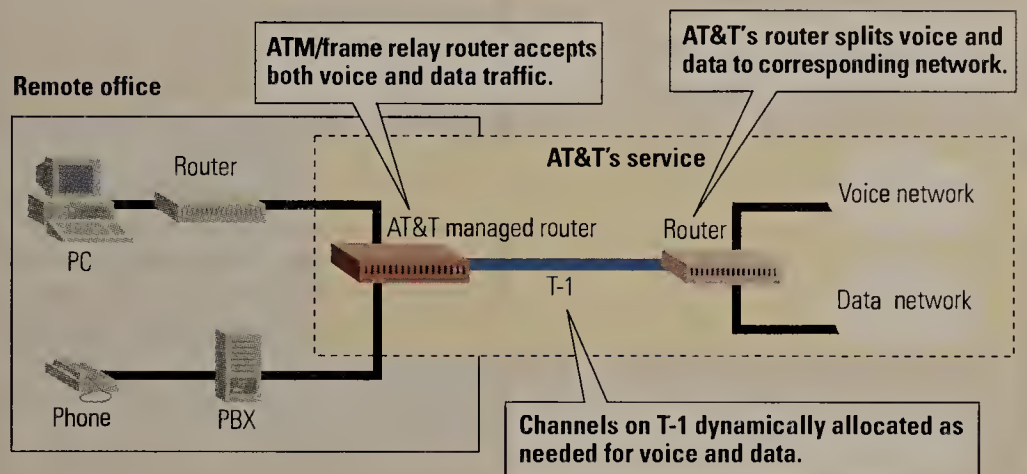
The Grand Rapids, Mich., company recently entered into a three-year, multimillion-dollar deal with AT&T to implement a converged voice and data network across the country to improve the flow of information, such as furniture design documents, between headquarters and regional offices. Steelcase expects to save hundreds of thousands of dollars in the process.

The furniture manufacturer and its subsidiaries have dealers in 800 locations, manufacturing facilities in 30 sites and 20,000 employees worldwide. Its IT infrastructure has to support the shipment of 12,000 chairs and 700 truckloads of furniture each week, and keep track of 540-plus product lines.

Its aged AT&T frame relay network had started to groan under the weight of data that has to pass through. Steelcase was one of the first companies in Michigan to implement frame relay, installing it in 1992. Most of its regional offices started with a committed information rate of 64K

Remote-office lifeline

AT&T's Integrated Network Connection Service carries both voice and data traffic for Steelcase and others.



SOURCE: STEELCASE

bit/sec, and some were later upgraded to 128K and eventually 256K. But late last year, Steelcase discovered a converged voice and data network from AT&T would save up to \$240,000 annually.

"We needed to create a network that supports a wide range of applications and give users more timely access to information," says Robert Krestakos, director of Steelcase's business technology group. He adds that new convergence options

helped make that possible.

"For a long time there was not much available beyond frame relay and point-to-point connections," he says.

Steelcase uses AT&T's ATM-based Integrated Network Connection Service (INCS) to not only combine voice and data into a single network, but also to run videoconferencing to remote sites and send bandwidth-intensive, CAD-based fur-

See **Convergence**, page 24

Metricom's failure a loss for WorldCom customers

BY DENISE PAPPALARDO

As Metricom goes under, it's taking WorldCom's mobile wireless Internet service along with it.

Metricom recently announced it is shutting down its network only a month after filing for bankruptcy protection. The company's assets will be auctioned off Aug. 16.

The termination of Metricom's Ricochet wireless Internet access network means some WorldCom customers will be left in a lurch.

WorldCom started offering Metricom's 128K bit/sec mobile service to business users last year under the name WorldCom Wireless Internet. It's not clear how many WorldCom customers are affected, but the company says it is relatively few.

Metricom notified WorldCom on Aug. 2 that the service provider would be

decommissioning its network by Aug. 8. WorldCom immediately stopped billing customers, according to a spokeswoman from WorldCom.

Because WorldCom doesn't offer another mobile Internet access service, customers cannot be transitioned to another service. WorldCom is offering customers Internet access services options such as DSL, multichannel multipoint distribution service or dedicated services, but none of the options offer a mobile alternative.

WorldCom doesn't have specific plans to replace this service, but is evaluating all options, a company spokeswoman says.

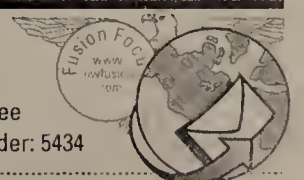
Not only did WorldCom sell Metricom's service, but it also made a hefty investment in the company. In July 1999, WorldCom invested \$300 million in the wireless service provider. Vulcan Ventures invested another \$300 million at the same time.

Clearly, WorldCom didn't want to increase its stake in the failing venture by trying to save it from bankruptcy. Metricom indicated it hoped another company might buy it. However, WorldCom may be interested in picking up some of Metricom's assets in its auction later this month. This development wouldn't be surprising considering WorldCom doesn't own a mobile wireless network that could support a similar service, although it owns a wireless paging network and some fixed wireless properties.

WorldCom would not comment about its specific wireless service plans. ▀

Wireless

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The key ingredients of a great international golf tournament are superb golfers, an inscrutable course, and millions of golf fans following the action on television and, increasingly, on the Web. Today, owing to a time-tested computerized scoring system from Unisys, fans are closer than ever to the action.

"The scoring system has got to get it quick and get it right the first time," notes David Fox, Director of Sports Marketing at Unisys. "And the system has to quickly translate ever-changing match scores into all the different formats the fans demand."

Whether it's a top-10 leader board, a tournament-wide score board, or a computerized analysis of the toughest holes based on consolidated scoring, the system has to hum with the precision of a 30-foot birdie putt.

Unisys provides the scoring system that feeds global television and Web broadcasters for all USGA events such as the U.S. Open and U.S. Senior Open, as well as for the British Open and European PGA events. Unisys-generated scoring graphics appearing on television and computer screens have become a major part of the fast-growing international broadcast appeal of these major sports events.

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Carriers & ISPs



Eye on the carriers . Johna Till Johnson

NEGOTIATIONS: UPSIDE OF A DOWNTURN

One of the great advantages of a market downturn is that vendors get hungry — and hungry vendors can provide lower costs and better services, at least for purchasers who are willing to dicker.

Telecommunications service costs represent roughly 30% of the typical company's IT spending, so if you haven't revisited your telecom contract in the past 12 months, now would be a great time. Network managers who are willing to put in the effort can decrease their telco expenditures by 20% or more.

Where to start? The first step is to issue a request for proposal (RFP). I know, I know — for most network managers, the prospect of writing a telecommunications RFP ranks right up there with getting a root canal. But it's the single most important step you can take.

For most large organizations, I usually recommend the "matrix RFP." The concept is to construct a matrix listing all the services your company uses across the top and all the geographic regions in which the

services are used down the left-hand side.

Services might include Internet services; local, national and international voice; WAN data ... and don't forget cellular. Geographic regions might include U.S. local, U.S. national, Asia/Pacific, EMEA (Europe, Middle East, and Africa) — you get the idea. Each square in the matrix thus represents a particular type of service in a particular region—for example, EMEA WAN data services.

This matrix then becomes the centerpiece of the RFP. Issue this to as many carriers as possible. Don't limit yourself to the "old faithfuls" — the AT&Ts, SBCs and WorldComs you've been dealing with for years. This is the one time that you return all calls from service providers — even the ones you've never heard of. Tell each they're welcome to bid on as many of the matrix squares as they wish.

Why do all this?

First, collecting all the telecommunications contracts forces you to come nose to nose with exactly how

much money your company spends on telco services. A client of mine recently pointed out that his company has 33 separate networks — and that's not counting wireless services.

Second, by listing all the services on a single RFP, you will get more attention from the providers. Particularly these days, a potential \$10 million contract is considerably more interesting to carriers than a \$1 million one.

Third, thanks to recent mergers and acquisitions, service providers may offer services or operate in regions that they didn't the last time you looked.

Finally, by laying out all the services you consume on a single page, you might get some creative ideas about how to reduce the number of networks and services you require.

What happens next? I'll cover that in my next column.

Johnson is senior vice president and CFO of Greenwich Technology Partners. She can be reached at johna@greenwichtech.com.

Convergence, continued from page 23

niture designs between locations.

The project began 11 months ago with an analysis of the options on the market. The company considered three options: sticking with frame relay while continuing to scale up as demands grow; implementing dedicated point-to-point leased lines; or converged services.

"Point-to-point T-1 or T-3 connections are very expensive, and if we continued to scale up the frame relay network for data without touching voice, that would have been more expensive" than combining voice and data on one net, Krestakos says. He declined to specify how much more expensive, but adds, "The T-1 option was incrementally higher than the frame option, but not unexpectedly so, and the T-3 option was several orders of magnitude more in cost. A point-to-point solution would also have put a lot of the management burden on us."

Steelcase evaluated competing convergence networks, AT&T INCS and Sprint ION, and opted for AT&T's offering because Sprint's service was not available in all markets, Krestakos says.

In March, Steelcase's Detroit office was the first to go live. It was chosen because of its proximity to headquarters and it didn't have a desperate need for extra bandwidth, so it presented fewer problems if anything went wrong.

Krestakos says the company had a plan in place to return the office to frame relay if there were difficulties.

The conversion team watched the new network for four weeks before it began rolling it out to other offices. Twenty-two sites have been targeted for conversion, and 20 have gone live.

Each site has a T-1 line, which can accommodate 24 channels. Each regional site installed a Cisco 3810 ATM multiplexer instead of a traditional time-division multiplexer, so the network can dynamically allocate bandwidth between voice and data. Krestakos describes this as "elastic bandwidth" because the network automatically devotes bandwidth where it's needed as traffic demands change.

"On average, one regional office consumes four to 10 voice channels and between four and six data channels. The usage on the data side can go up to eight or more channels," he says. This still leaves plenty of room if needed.

Although Steelcase has yet to quantify performance improvements, Krestakos says users have seen a "noticeable" difference. He also says AT&T customer care is more streamlined than before because Steelcase deals with one organization for voice and data.

"Moving a 1M-byte CAD drawing would have taken between 20 minutes and an hour before, but now it takes a reasonable amount of time," Krestakos

says. "INCS also gives us the option to offer high-quality 384 K bit/sec video over the data network, which would displace travel costs and make meetings more effective."

Although Steelcase has earmarked 22 out of its 30 regional sites to be converted to INCS, there are four sites where INCS doesn't offer enough capacity for the company's needs. In those cases, Krestakos says Steelcase will evaluate putting in AT&T's upcoming Enhanced INCS service when the regional office rollout is complete in a few weeks.

Enhanced INCS differs from classic INCS in that it uses Cisco's 3660 ATM multiplexer, which supports multiple T-1 lines instead of just one. ■

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VENDOR HYPE?

Read what one user has to say about the benefits of a converged network. Also, download tech specs on the AT&T Integrated Network Connection Service.

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CDNs serve up good early reviews

BY JENNIFER MEARS

In June, about 3.2 million unique visitors stopped by The Motley Fool's Web site to get the latest financial information, from stock quotes to research to educational materials. Despite the fact that traffic remains high at about 30 million page views per month, like most companies these days, The Motley Fool is reining in spending.

CTO Dwight Gibbs has had to pull back on some projects, but one thing he's not worried about is hardware costs. In fact, Gibbs plans to ultimately cut The Fool's hardware demands by three-quarters — from the 80 servers he hosts at Equinix to about 20. That's because he's moving more and more of his traffic onto a content delivery network (CDN) run by Akamai Technologies.

Other companies are also realizing the benefits CDNs can offer. For example, Monster.com signed a deal with Akamai, and MSN with Digital Island.

Custom delivery

CDNs deliver content from geographically dispersed servers that sit on the edge of various networks and deliver content according to the proximity of the Web surfer. A Web surfer viewing The Motley Fool Web site on a computer in California most likely will get content delivered from Akamai servers on the West Coast; a Boston viewer would get images from an Akamai server on the East Coast.

CDNs typically sit on ISP networks, where traffic to each server is limited only by the capacity of that network's bandwidth, and overflow traffic is routed among the CDN's servers.

So, when some sites are busy and others aren't, the busy sites get the capacity they need. As a result, CDN users don't have to worry about increasing bandwidth or hardware to handle spikes in traffic; all that is done automatically by the CDN that determines which server is best able to handle the load.

Analysts say Akamai leads the market, although the industry is still evolving, especially with efforts under way to let CDNs deliver content over disparate networks, a concept known as content peering. Peter Firstbrook, a senior research analyst at Meta Group, says about 2,500 companies use CDNs today, a 100% increase from last year. The growth rate is slowing, but he predicts about 14,000 companies will use CDNs by 2005.

Network executives who use CDNs say ending bandwidth worries, reducing (or maintaining) infrastructure costs, and, most importantly, improving the end-user experience are reasons they decided to move content out of their origin servers. They are concerned about security and the financial stability of vendors, but overall, CDN users seem pleased and

CONTENT DELIVERY NETWORKS

Service providers struggle despite positive reactions from users.

Spanning the globe

Content delivery networks cache content in servers on distributed networks. Here's a sampling of CDN infrastructure from different vendors:

Akamai:	More than 11,600 servers in about 820 networks in 62 countries.
Digital Island:	More than 2,500 edge servers on 327 networks in 35 countries.
Mirror Image:	22 content access points (CAP) in the U.S., Europe and Asia. Each CAP is in an Exodus collocation facility and includes servers, routers and databases.
Speedera:	100 points of presence in more than 1,000 networks in 20 countries.

ready to put more content on the networks as the technology advances to handle Web services and other application processing.

Benji Jasik, director of engineering at WeddingChannel.com, says he started considering a CDN when he noticed the site, which is hosted on about 35 servers collocated in an Exodus Communications facility on the West Coast, was performing poorly on the East Coast.

"We weren't going to host our site in two different locations," Jasik says. "But we knew that 40% to 50% of a lot of our pages were static content or images, so we could put those on a CDN and get a big performance boost there."

WeddingChannel.com started using Speedera Networks' Universal Delivery Network in June and performance has improved on the site, which records about 1.5 million unique visitors, or about 35 million page views, per month. Easy implementation was one reason for choosing Speedera, Jasik says.

"All we had to do was switch our DNS over, just rename it to their DNS and then we were all of a sudden on their CDN," he says.

For Sean Armstrong, Internet development manager at OpenSystems, a network intelligence software maker, cost and technology were what sent him to Mirror Image. OpenSystems has a half-dozen servers collocated at Exodus, but uses Mirror Image's network to handle the traffic spikes that happen when a new version of software or a software patch is released.

Armstrong says he's used Mirror Image for about a year and likes the fact that the Mirror Image technology can pull content directly from his servers.

"The way they have it set up is, in the code of our Web pages we make a request for their servers to forward [content]," he says. "They check their system and if they don't have the file that was requested... they redirect [the request] to our host server for the first download. At the same time, they get the file for their distribution system. So, the first download comes from us and every

download after that comes from them. We don't have to do any work to get the files pushed out to their servers. It just happens automatically."

Armstrong says the site's performance has improved dramatically and that the CDN is saving OpenSystems a significant amount of money.

Software maker Intuit was one of the first companies to use a CDN when it signed on with SandPiper Networks in 1998. Digital Island bought SandPiper in 1999, and Intuit uses Digital Island's Footprint CDN to enhance the performance of its origin servers in six data centers in the U.S. and Canada.

"We started slow... and every year since then have grown more and more accepting of the technology and confident of their offerings and have done more with them," says Steven Turner, data center network manager.

Down to earth

CDNs emerged a few years ago with Akamai leading a pack of high-flying ventures. However, the dot-com bust hurt the fledgling companies, as their customer base vanished. Akamai, for instance, reported disappointing numbers in its first quarter this year, and cut staff and took other cost reduction steps. Those steps, along with the growing adoption of its dynamic content delivery service, called EdgeSuite, lifted its second-quarter revenue above expectations.

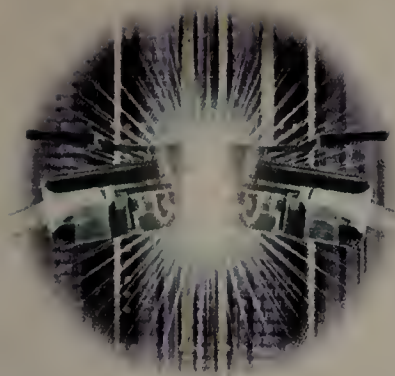
Still, analysts say other players, such as Speedera and Adero, aren't doing as well, which is something companies should think about when signing up with a CDN.

However, overall, the case for CDNs remains compelling, says The Motley Fools' Gibbs.

"Every CFO is coming to the CTO and saying, 'You're expensive. Minimize your cost now,'" he says. "Well how do you do that? If you're growing, you don't want to buy more servers."

Use a CDN. If you're shrinking, you don't want to deal with running so many servers, so go ahead and use a CDN.

Pull some of the gear out of your data center and deal with fewer people. It helps on both ends. It helps you scale up and it helps you scale down." ■



The Edge

Service provider developments at
the juncture between the enterprise
and the new public network

Briefs

Multi-protocol Label Switching switch maker **Integral Access** last week announced that service provider **OneStar Communications** will use Integral's PurePacket switches to provide converged voice, data and Internet access to business customers in tier two and three markets in the U.S.

OneStar will use PurePacket switches to offer local calling, long-distance calling, data services and high-speed Internet access. The company will initially launch bundled services delivered over a single phone line to customers in Portland, Maine, and surrounding communities.

OneStar will use PurePacket's Media Gateway Control Protocol to support its softswitch packet telephony architecture and services. This will let OneStar deliver traditional local and long-distance voice services, as well as IP-based services.

OneStar: www.onestar.com; Integral Access: www.integralaccess.com

Ericsson and Verizon Wireless have reached agreement to sell products, including the Ericsson A1228c handset, in the U.S. through Verizon Wireless direct and indirect channels.

The companies are also conducting trials with Ericsson handsets using Code Division Multiple Access (CDMA) technology with mobile data transmission speeds of up to 144K bit/sec.

The A1228c is a mobile phone that can access the Web, e-mail, and other mobile information and communication services. The phone operates in the 800-MHz band on CDMA digital networks and analog networks.

Verizon Wireless: www.verizonwireless.com; Ericsson: www.ericsson.com

Corrigent touts RPR breakthrough

CM-100 promises SONET features at Ethernet prices.

BY TERRI GIMPELSON

Start-up Corrigent Systems is emerging from stealth mode to introduce a Resilient Packet Ring metropolitan/access switch that attempts to provide SONET performance at Ethernet economics.

Corrigent will target incumbent carriers with its CM-100 RPR switch, says Nigel Cole, the company's vice president of business development.

"Most people are focusing on putting Ethernet into their networks, but they tend to use [an] Ethernet-type timing scheme in an architecture that doesn't allow high-speed [time-division multiplexing]," Cole says. "Our solution will carry that Ethernet-type timing along with high-speed TDM over packets."

He says the CM-100 will be less expensive than other optical Ethernet switches because it uses the distributed switch architecture of an RPR topology. Unlike a typical logical hub-and-star system, the distributed switch architecture does not use a centralized switching hub to backhaul all traffic. Instead, all nodes on the ring are given the switching functionality that the centralized hub was once given to distrib-

PROFILE: CORRIGENT

Location: San Francisco; R&D headquarters in Tel Aviv, Israel.

Founded: September 2000

Product: The CM-100 RPR metro/access switch.

CEO: Ehud Rokach

Financing: Orkit Communications and other undisclosed investors.

Employees: 85

Competitors: Extreme, Riverstone, Atrica, Lantern, Luminous, Nortel, Fujitsu.

Fun fact: Corrigent Systems has a staff that collectively speaks more than a dozen languages.

ute the functionality around the ring.

Because it has fewer optical segments, a distributed switch architecture uses fewer optical ports to connect all nodes on the ring, which reduces equipment costs, Corrigent says. Additionally, legacy rings use optical ampli-

fiers that are not used in distributed switch architectures.

"Instead of having a dedicated wavelength per node and having to backhaul traffic to a hub," Cole explains, "a distributed switching architecture takes the switching function at that hub and distributes it around the ring. This adds capacity at each node and makes for a cheaper solution because you need half the number of optical ports."

But a distributed switch such as the CM-100 retains full carrier-class resiliency and protection of a SONET network, including SONET compatible operations, administration and maintenance, Cole says.

"We firmly believe that, because of its distributed switch architecture, RPR will prove to be cheaper than Ethernet," he says. "Ethernet was not originally intended for carrier deployment, but with RPR, carriers can have their cake and eat it too."

The CM-100 is in beta tests. Corrigent officials did not disclose when they expect to ship the switch, nor has the company released other specifics. The product is expected to compete against RPR switches from Lantern Communications and Dynarc, among others.

Corrigent: www.corrigent.com

DOCSIS compliance delaying cable IP telephony

BY JIM DUFFY

SCOTTSDALE, ARIZ. — Even though the standard has been in place for more than a year, lack of product certification is holding up the rollout of IP cable telephony, according to market research firm Cahners In-Stat Group.

It will be late 2002 or early 2003 before widespread deployments of IP-based cable telephony occur, the research firm predicts. Until then, cable operators who offer telephone service will continue to rely on traditional circuit switching.

"None of the equipment has been certified" to be compliant with the DOCSIS 1.1 standard or interoperable with like equipment, says Mike Paxton, a senior analyst with In-Stat. "That's really been the bottleneck for the last 12 months or so."

Manufacturers of cable modems and modem termination equipment have been familiar with the DOCSIS 1.1 standard for

18 months, Paxton says. It features quality of service, voice over data and security extensions beyond DOCSIS 1.0.

Vendors go through four "waves" of certification trials, each lasting about six weeks, he says.

"They've been testing and retesting, trying to get [certification] down for the past year," Paxton says. "But they haven't gotten there yet."

Results from the current wave are expected by the end of next month, he says.

Even with the delay in provisioning IP-based technology, cable telephony could see solid subscriber growth in the next five years, In-Stat says. Circuit-switched service or a twisted-pair overlay service will account for the lion's share of subscribers. Total worldwide cable telephony subscribers are forecasted to rise from 2.8 million at the end of last year to more than 15 million by 2005, with the majority of

subscribers in North America and Western Europe.

Resulting worldwide cable telephony revenue will rise from \$1 billion in 2000 to about \$6.5 billion in 2005, In-Stat says.

In-Stat forecasts that IP cable telephony subscribers will reach five million in 2005, just one-third of the worldwide total for cable telephony. ■

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Briefs

The International Information Systems Security Certification Consortium, a nonprofit organization that grants security credentials, last week announced it would undertake to publish a "uniform best practices" document through a contribution process. The document, expected to be completed by year-end, would detail security practices for systems, including Unix, and formulate security policies. More information about the project is available at www.caspr.org.

In a bid to get ahead on XML technology, Corel last week snapped up XML developer SoftQuad Software in an all-stock transaction valued at \$37 million. With the XML technology in-house, Corel says it now has the technologies needed to deliver a product that will let customers create, manage and simultaneously publish content across multiple delivery channels. SoftQuad has partnerships with makers of content management systems. The XML capabilities in WordPerfect, Corel's word processing software, will also be expanded.

Corel: www.corel.com; SoftQuad: www.softquad.com

McAfee.com last week said the U.S. Patent Office granted it a patent covering the company's method of delivering software as a service through Web browsers. The patent covers the business and technology models McAfee.com uses to deliver its security, management and optimization services. The technology, which McAfee.com has worked on since 1998, integrates a series of scripts, software objects and back-end systems with a markup language such as HTML or XML to deliver up-to-date applications through a standard Web browser.

McAfee.com: www.mcafee.com

FIVE QUESTIONS WITH MIKE HOMER

Kontiki keen on content delivery plan



After years as an executive at Netscape Communications and AOL, Mike Homer took

on a series of investment and advisory roles at Loudcloud, Tellme Networks, Palm and TiVo starting in 1999. Network World Senior Writer Kathleen Oblson spoke with Homer about Kontiki, a recently launched peer-to-peer content distribution company targeting corporations and media companies.

The current economic conditions have hurt many companies, and some people are leery about launching a new venture. Were you fearful?

No, I wasn't fearful. First of all, since leaving AOL in April 1999, I've been a founding investor in Loudcloud and Tellme in the last year and a half. Working

PROFILE: KONTIKI

Location: Mountain View, Calif.

Founded: November 2000

Service: Kontiki Delivery Network, which delivers video, audio, software and games.

Founder: Mike Homer, CEO

Financing: \$18 million so far. Investors include Marc Andreessen, The Barksdale Group and Benchmark Capital.

Competitor: Akamai Technologies

Fun fact: Company drink known as Sneaky Tiki: vodka, splash of pineapple juice, slice of orange and a cherry.

millions of people.

Who is your target audience?

The end users in businesses, colleges and homes are the target audience. People buy the service from entertainment and media companies, which delivers rich media to end users. [Kontiki is also targeting large companies.]

How does the Kontiki Delivery Network work and what are you offering?

Anything a user orders will appear in an inbox; they'll get it and read it like an e-mail. . . . The end user sees the Web site links and clicks on the video.

The Kontiki Network asks for permission, it downloads the client and then launches the audio, etc.

If a customer has DSL or broadband, whatever they order will come in less than a few seconds. If they don't have Windows Media Player or RealPlayer, [the Kontiki Delivery Network] will go out to automatically get it.

See **Kontiki**, page 30

with investors the entire time, out of the hundreds and hundreds of companies, I've seen only two companies that had good management with big ideas — Loudcloud and Tellme. What I mean by a big idea is [one] impacting hundreds of

Siemens, Fischer bring metadirectory to mainframe

Prio suite of products designed for OS/390, z/OS systems in finance, healthcare, insurance sectors.

BY JOHN FONTANA

The metadirectory is getting a meta-platform.

Siemens and Fischer International have teamed to deliver a metadirectory for IBM OS/390 and z/OS mainframes, which means big-iron users won't need to create a separate infrastructure just to deploy an overarching directory implementation. And the powerful mainframe, with its attention to transactional integrity, is a natural for the transactional loads put on a metadirectory.

Next month, the two vendors will release Prio, a suite of products that includes the Siemens DirX directory based on X.500 and the Lightweight Directory Access Protocol, the Siemens DirX-metahub metadirectory and a collection of Fischer's SureSync connectors for systems such as Lotus Notes, Microsoft Exchange, Novell's eDirectory and iPlanet Directory Server.

Mainframe metadirectory

Siemens and Fischer International are working together to create Prio, metadirectory software for the mainframe that pulls together information scattered across a variety of enterprise systems.

Using a set of standard protocols, the Prio metadirectory can create connections with any number of enterprise systems or directories.

Other enterprise systems

- iPlanet Directory Server
- Novell eDirectory
- Microsoft Active Directory
- Microsoft Exchange
- IBM DB2
- Lotus Domino
- SAP

OS/390 or z/OS mainframe

Prio Enterprise Directory

Prio metadirectory

Protocol support ODBC, DSML, XML . . .

Management advantage

A metadirectory is a centralized hub that collects data from any number of other directories and data repositories,

and joins them together into a logical whole to minimize management of end users and data.

See **Metadirectory**, page 30



'Net Insider . Scott Bradner

A BLURRY VISION?

On Aug. 2, right above a story about a new and cheaper generic version of Prozac, *The New York Times* announced the Internet of tomorrow. If the prediction comes true, network managers may be glad Prozac will be getting very cheap in a few months. But, sorry Prozac makers, it will not come true.

The headline read "I.B.M. Making A Commitment To Next Phase Of the Internet." The article described "grid computing" and said, "The grid vision is that everyone at a desktop machine or handheld computer could eventually have the power of a supercomputer at his or her fingertips, by amassing the processing power and information resources attached to networks."

The basic idea here is to reach out over the network and use the idle power of computers all over the

world. A widely used working example of this is seti@home (www.seti.org), which has been installed on a few million computers in an attempt to find signs of intelligent life elsewhere in the universe. The grid folks (www.globus.org) see a wide application of this type of technology from weather prediction to earthquake simulations. It makes sense for that type of application, and there are more than a few applications that fit this picture.

OK, I'll bite: Why do you and I want this? If the *Times* headline is right and this is the next phase of the Internet, then it should be useful for ordinary mortals. It is true that some software vendors seem to have development projects to increase the size and complexity of their software to compensate for any increases in memory size and processing power, but even they

will not be able to make use of this much power. And I don't think I need my Palm forecasting the weather on its own.

IBM, Microsoft, the U.S. government, a number of European governments and other groups are putting a lot of money into this grid vision. But only some of this money is being well spent.

The grid technology will be quite useful for a number of applications, and the number of these applications may grow over time. But I do not think the grid will transform the Internet.

The grid vision depends on solving difficult problems and on the assumption that there will be general utility for the idea. One of these problems is figuring out how to compensate the owners of the computers for their use. Without this being solved, I fear that the technol-

ogy will only be useful for feel-good projects, such as listening in on E.T.'s calls home.

I also fear that, like the Distributed Computing Environment (better known as DCE), which I wrote about a few weeks ago, the cost of management will be higher than the cost of replicating the resources for most applications.

I expect most of the Internet will be unaffected by the grid vision. Remember that one of the big strengths of the Internet is that it can support any number of limited-use visions such as the grid.

Disclaimer: Harvard has seen visions come and go, but I did not ask the university about this one.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Kontiki,
continued from page 29

Video, audio, music, software, games and documents in PDF and images in JPEG will be offered. You can pick and choose what you want, whether it's a 2-minute audio or a 90-minute video.

How is the Kontiki Delivery Network different from what's being offered now?

We've built specific software that handles different things. It's similar to traffic signals. Video is wrapped and sent through . . . various routes and [the network] organizes the pieces. It sends it over the routes even if a certain route is at fullest capacity.

We offer time shifting, or subscriptions. For example, a user wants CNN morning news at 6 a.m. We need it to be delivered between midnight and 6 a.m. and we look at the best times to deliver that on a single route.

It works similar to an air traffic controller trying to slot a plane and bring the plane to land.

What kind of security have you implemented in the network?

There's no way a person can ask for a file or forward it along. Peer-to-peer technology controls all the nodes.

The first thing we do is encrypt network protocols using network nodes.

There's no way anyone can change, intercept or replace any of the nodes. It's like a prison — once you're in there, we can't let you out or let anybody in.

Each file has a unique identifier, it's encrypted and sent through the network. On the other side, it's decrypted and the network identifiers are compared.

If any bit of the file is changed, the file will be discarded. . . . Business rules are given [by the company to the end user surrounding] how and when the file will be used. . . . It's a fully distributed secure network; it won't allow anything foreign in. ■

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CONTENT DELIVERY

Read how Kontiki Delivery Network targets enterprise and media companies, such as CNN, "60 Minutes" and Charles Schwab.

DocFinder
find it **5530** online

Metadirectory,
continued from page 29

The Siemens directory and metahub currently run on Windows and Unix systems, which can incorporate data from a mainframe. Now, the powerful mainframe platform can be used to handle the hefty storage, data update and synchronization requirements of running a metadirectory.

Prio aims to make the mainframe the hub of an enterprise directory that can pull together, or "join," all the information scattered across various data sources and corporate directories, including Microsoft's Active Directory and those from Novell and iPlanet.

"If you have a 390 infrastructure, you can now throw it into the mix," says Michael Hoch, an analyst with the Aberdeen Group. "The fact that you now have a metadirectory for that platform makes it just that much more flexible."

The intent of Prio is not to foster mainframe sales, but to serve an existing customer base in the financial, healthcare and insurance industries, according to Art Burton, president of Fischer, which has more than 15 years of experience working with mainframe technology. "The idea is that the customer base won't have to make an

additional infrastructure investment to build a metadirectory."

IBM abandoned its off-the-shelf SecureWay metadirectory for the mainframe, but still makes it available through its Global Services consulting division. There are no other commercial metadirectories for the mainframe.

"This creates a highly reliable and scalable platform that can handle thousands of transactions," says Peter Schnitter, president of the metadirectory business unit for Siemens. "But it also is a place to support other services that rely on the directory, like [public-key infrastructure]."

Schnitter says the metadirectory also would be able to scale to tens of millions of entries.

The Prio metadirectory is expected to ship in mid-September. Both Fischer and Siemens will offer consulting services for the deployment of Prio. Pricing has not been announced.

Siemens: www.siemens.com;
Fischer: www.fisc.com

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Palm gets a tighter grip on documents

BY JOHN COX

Palm handheld users can now work with the same Microsoft Word and Excel files on their Palm OS devices as they do on their Windows PCs.

With DataViz's Documents to Go Professional Edition Version 4.0, users can create or change such documents. These changes then update the original PC files, preserving all other original formatting, such as fonts, tables and graphics, whenever the handheld resynchronizes with the PC.

Other new features include Slideshow to Go, a program that lets Palm users view PowerPoint files; and Sheet to Go, which lets users create or view any Excel-compatible spreadsheet.

Documents to Go 4.0 Professional Edition is available now for \$70, and includes the DocSync program and PowerPoint viewing application. Version 3.0 costs \$50. A Standard Edition, for just word processing and spreadsheets, will be available later this month for \$50.

DataViz: www.dataviz.com



Technology Update

An Inside Look at the Technologies
and Standards Shaping Your Network

Ask Dr. Internet

By Steve
Blass

We're based in
Pakistan and
have a network
project with the
following basic
requirements: The
head office has one

server for logon authentication and one database server. We have 34 regional office servers that each support sign authentication for 10 to 20 dial-up PCs. The distances between the main office and regional office servers vary from 62 to 496 miles, and from 19 to 186 miles between regional and branch offices. One PC can connect at a time to a regional office server from a branch office. Regional servers may need to connect directly without going through the head office server. Branch offices connect to a regional office once a day and send between 2M and 5M bytes of data. Regional offices connect to the head office many times a day and send from 50M to 100M bytes of data. For security, we don't want to use an Internet solution.

Reconsider using an Internet VPN for the branch offices. Or find a carrier that can provide dial-up infrastructure and network circuits. Connect the head office and the regional offices with a hub-and-spoke topology, and route branch-to-branch connections through the hub using your favorite router and switch hardware. Carrier pricing will guide your network decision, but ideally you would put the head office on multiple T-1 lines and connect the branches via fractional T-1 connections using Frame Relay or IP.

Blass, a network architect at Change@Work in Houston, can be reached at dr.internet@changeatwork.com.

Bluetooth 1.1 addresses earlier flaws

BY TROY HOLTBY

Imagine wireless connectivity that lets you effortlessly exchange business cards, files and other information with a co-worker. Or wireless technology that lets you set up your own personal-area network to link your PC to handheld devices, mobile phones, printers, scanners, fax machines and copiers. The new Bluetooth 1.1 specification promises to make such affordable wireless connections an everyday reality.

Bluetooth Version 1.0b failed to fully deliver on its promise as a result of unexpected interoperability issues. Bluetooth 1.0b defined specific functionality but did not mandate specific implementation criteria, leaving key parts of the specification open to interpretation.

As a result, interoperability problems arose and thwarted widespread implementation. When a Bluetooth cell phone from Vendor A does not work with a Bluetooth PC card from Vendor B, the user is not exactly encouraged to buy a Bluetooth printer from Vendor C. Fortunately, Bluetooth 1.1 addresses these interoperability issues.

The most significant change to Bluetooth in Version 1.1 involves authentication. Bluetooth communications are encrypted for security. When two Bluetooth devices try to establish a link, one of the first things they do is exchange keys confirming their identities. If the keys don't match, the two devices won't talk to each other.

Under Bluetooth 1.0b, the two devices could get into an irreconcilable race condition during the initial link negotiation. The devices would execute the algorithm to generate the key, but each device would generate a different key. The problem revolves around timing.

Generating the correct key depends on which device initiates the conversation (the master) and how fast the responding device (the slave) replies to the master's communications. If the slave can process information faster than the master, the ensuing race condition can leave each device calculating that it is the master.

Based on that error, the devices fail to generate matching keys.

Bluetooth 1.1 rectifies this problem by more thoroughly defining the steps required for device authentication. Specifically, Version 1.1 requires that each device confirm its role in the master/slave relationship by reconciling and/or acknowledging which device initiated interaction.

A more basic interoperability issue concerns the harmonization of frequencies. Bluetooth divides the 2.4-GHz frequency into 79 hops. Using a technique called frequency-hopping spread spectrum to trans-

Special Interest Group negotiated with the 23-hop countries to allow use of 79-hop equipment, which let Bluetooth 1.1 eliminate the 23-hop option. All Bluetooth 1.1 devices use 79 hops to communicate within the 2.4-GHz frequency.

Incompatible data formatting could also prevent interoperability in Bluetooth 1.0b devices. Bluetooth supports up to five slots per packet to reach its maximum data transfer rate of 720K bit/sec per channel. However, not all Bluetooth devices support five-slot packets. If a master tries to send more slots

HOW IT WORKS

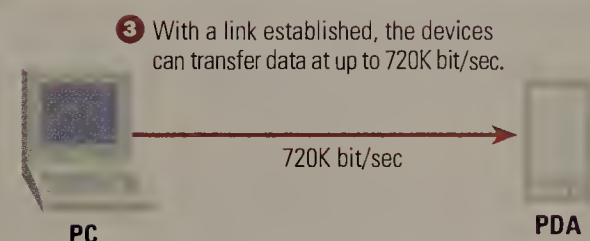
Bluetooth 1.1

Bluetooth 1.1 clears up an authentication problem found in Bluetooth 1.0b. With 1.0b, links between devices sometimes were not established because of algorithm speed issues.

- Two Bluetooth devices want to establish a link. The device that initiates the interaction becomes the "master," the other device the "slave," for purposes of establishing a link. The master device dictates the frequency-hopping schedule; the slave device indicates the number of slots per packet it can receive.



- With Bluetooth 1.0b, the slave would sometimes process the algorithm faster than the master, and both devices would believe they were masters. With two "masters," no link would be established.



- With a link established, the devices can transfer data at up to 720K bit/sec.

mit data, the master and slave must synchronize their movements up and down the 2.4-GHz frequency to maintain their connection. If they don't arrive at the same hop at the same time, the devices can't communicate.

Unfortunately, France, Japan, Spain and a few other countries use the 2.4-GHz frequency for noncommercial purposes, such as military communications. To accommodate these countries, Bluetooth 1.0b defined a second hop count that avoided select areas of the 2.4-GHz spectrum and divided the frequency into 23 hops. Devices built to work at 79 hops are incompatible with those built to work at 23 hops.

To address this problem, the Bluetooth

per packet than the slave can support, communications fail.

Under Bluetooth 1.0b, slave devices couldn't tell master devices how many slots could be used during communications. Bluetooth 1.1 fixes this problem by letting the slave communicate back to the master with information about the packet sizes. In Version 1.1, a slave can tell a master to send fewer (or more) slots per packet when necessary.

The Bluetooth 1.1 specification was finalized earlier this year, and vendors have begun shipping 1.1-compliant products.

Holtby is Bluetooth product manager at 3Com Corp. He can be reached at Troy_Holtby@3com.com.

Got great ideas?

Network World is looking for great ideas for future Tech Updates. If you've got one, and want to contribute it to a future issue, contact Features Editor Neal Weinberg (nweinberg@nww.com).



We've made the Windows 2000 platform more manageable than ever. For obvious reasons. Clearly, you have a lot on your mind these days. But now there's help: Microsoft® Windows® 2000-based management solutions are designed to simplify your workload. Companies such as Data Return, Eaton Corporation, and Northrop Grumman Corporation, working with service partners such as Compaq, are using these solutions today. As a result, they're realizing reduced IT management costs, higher profitability, and increased customer satisfaction. For more information on how to better manage your Windows-based infrastructure, visit microsoft.com/business **Software for the Agile Business.**

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Microsoft



Gearhead . inside the network machine . Mark Gibbs

STILL MORE FTPING

So last week in our discussion of FTP we tried to get to the point where we send and receive files but we got sidetracked by transfer modes.

This week we really will get to move files around.

To recapitulate: We have connected, authenticated (commands USER and

PASS), changed directories (CWD), set the translation type to ASCII (TYPE A), listed the current directory (LIST), set the translation type to image (TYPE I), and set the transfer to be passive (PASV, specifying that we will access a server-defined port for the data transfer — remember that commands are issued

on port 21 and data transfers are performed on some other port specified by the FTP client or the FTP server).

We've left the transmission mode to default to stream (the command we won't send would be MODE S) and so now, let's transfer a file:

RETR myfile.zip

150 Opening image mode data connection for myfile.zip.

226 Transfer complete.

On our end, after the command and before the 226 response, we had to open the server port, start reading data from the port and store the data in a file. As we discussed last week, in stream mode the end of a file is signified by the stream ending — the server closes the connection and we assume that signifies the end of file, unless of course the transfer got garbled. Usually this is not a problem, but if your connection suffers packet loss you might need to use block or compressed mode if the client and server support them.

Sending a file is much the same except we use the STOR command:

STOR myfile.zip

150 Opening image mode data connection for myfile.zip.

226 Transfer complete.

If you want to stop the current file transfer, you just need to issue an abort (ABOR) command. Then there is the no operation (NOOP) command that tells the server the client is still alive. Most FTP clients use this command to keep the current session alive (that is, so you don't have to keep logging on).

Manipulating files is pretty straightforward: Changing file names is done with the "rename from" and "rename to" commands (the latter must immediately follow the former), thus:

RNFR myfile.zip

350 File exists, ready for destination name

RNTO myfile2.zip

250 RNTO command successful.

Other useful commands are delete (DELE <filename>), remove directory (RMD <dirname>) and make directory (MKD <dirname>). If your client gets into a mess or you need to restart the connection to an FTP server for any reason, you can reinitialize (REIN), which logs you out so, not surprisingly, the next command really should be the user name command (USER) followed by the password command (PASS).

Finally, if you want to end your session with the server, you should issue the logout (QUIT) command (although if there's no data transfer in progress, simply dropping the connection will have the same effect but faster).

FTP is a reasonably straightforward protocol, and if you want to get deeper into FTP technology check out the FTP Protocol Resource Center at <http://war.jgaa.com/ftp/>.

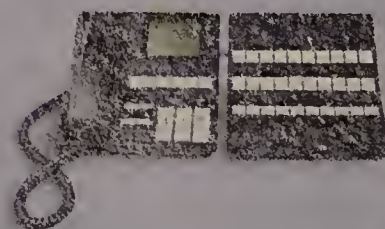
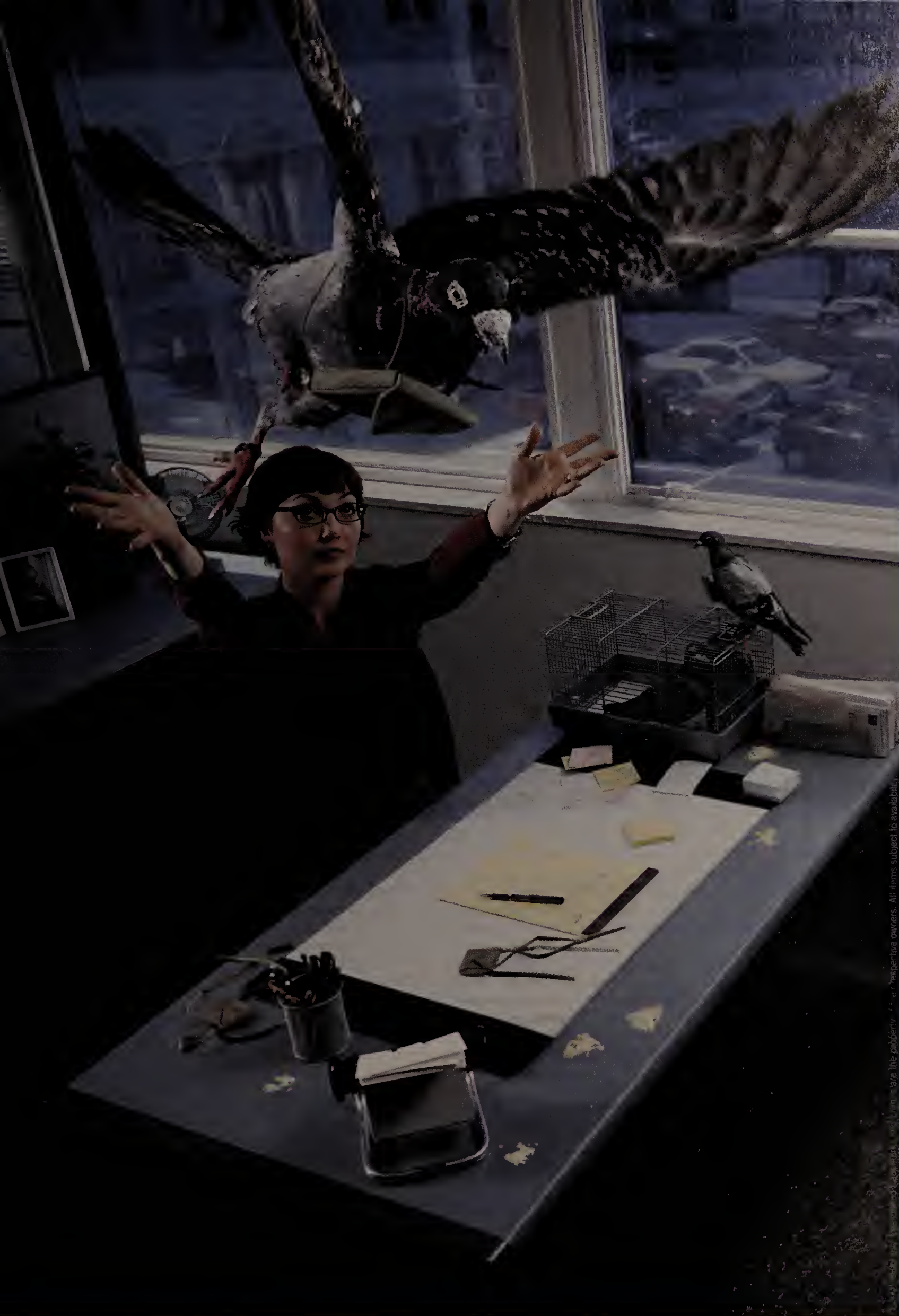
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Some things in life are never certain

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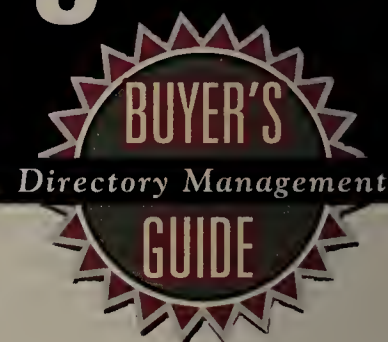
see this:  welcome new users



New tools help ease migration, monitoring

Directory vendors and third-party players offer a variety of add-ons.

BY JOHN FONTANA



it was migration; now it's management. • As companies discover the benefits of running a centralized corporate directory for user and group administration or e-commerce, they have two basic hurdles to overcome: migration of users to that directory, which is the main issue for Windows NT users moving to Windows 2000 and Active Directory; and management, which early adopters of Active Directory are discovering and users of more established directories, such as Novell's eDirectory, iPlanet's Directory Server or Critical Path's inJoin Directory Server, understand.

Beneath the industry hype, the directory is another piece of infrastructure that must be managed. Major vendors and their third-party allies are addressing that reality and beginning to provide tools for adding remote management over the Web, monitoring and alerting, auditing and administrative delegation.

"If you don't use a set of directory management tools, you have to question how critical your directory really is," says Don Bowen, an analyst with The Burton Group. "The expectation should be one of dial tone service from your directory. If not, it's not a serious piece of infrastructure."

All the evidence points to the directory becoming an important tool, so directory stalwarts are refining their management offerings, while newcomers scramble to field tools for post migrations.

Novell, for instance, is developing enhancements to its Management Framework in the next version of eDirectory due out early next year.

"Mostly what we are doing is making the management interfaces more accessible and intuitive," says Ed Anderson, director of product management for directory services. Those interfaces on the key eDirectory management components — iManagement, iMaintenance and iMonitor — will be available through a browser or nearly any device, including those running Palm OS and Windows CE.

The interfaces are generated in an XML format that is run through a stylesheet processor to render it for a specific device or a Web browser, according to Anderson.

On top of those features, third-party vendors — such as NetPro with DS Expert and DS Analyzer;BindView with bvAdmin for Novell Directory Services (NDS); and NetVision, with its suite of products featuring Synchronicity — provide auditing, alerting, diagnostic, synchronization and policy management features for eDirectory.

Another vendor is PatchLink, which offers DS Doctor for monitoring the overall operating condition of all NDS partitions. Coupled with the company's WebConsole, administrators get a Web-based interface.

Web-based management is an additional feature Critical Path has built into the latest version of its directory. InJoin Directory Server 4.0 shipped in June with a Web-based remote management capability called

Icon. The console lets directory administrators add and delete users, start and stop the directory, add content, create replication processes, perform backups and monitor diagnostic information.

While those established vendors are enhancing management functionality, relative newcomer Microsoft's Active Directory offers about 25 management tools as "snap-ins" to the Microsoft Manage-



BUYER'S Directory Management GUIDE

Trend story

Both the directory management vendors and third parties are coming out with new tools to ease directory migration and monitoring. **This page.**

Product roundup

We check out the latest third-party directory management products. **Page 40.**

Online

Interactive Buyer's Guide chart.
www.nwfusion.com,
DocFinder: 5534

STEPHEN SAUER

ment Console. Those snap-ins include tools for managing users, computers, sites, services, domains and trusts.

But even Microsoft admits large companies will use third-party tools to manage Active Directory, and a number of vendors are stepping into that role. The big trends are toward monitoring, Web-based front ends, data integrity and role-based delegation of administrative rights.

The latter, Active Directory's big improvement over NT administration, is available natively from Microsoft, but delegation must be done per individual administrator.

Vendors such as Aelita, BindView, NetIQ and Quest Software (formerly FastLane Technologies) offer intuitive role-based tools that let permissions be delegated based on what role an administrator is assigned. And the vendors are pushing those tools with an eye toward evolving into limited user self-service functions.

"These vendors are extending the capabilities of the directory beyond what Microsoft had envisioned," says John Enck, an analyst with Gartner. However, he says the roles-based tools won't be for everyone, especially those on a budget.

Delegation

NetIQ and Quest are probably the leaders in the delegation area. Quest's Active Roles, released in March, allows the creation of roles that can be assigned to administrators or groups of administrators. Once assigned, any changes in the roles are automatically updated for every administrator. Active Roles is a directory-enabled application built on top of Active Directory, meaning it uses the native replication and other services.

On the other hand, NetIQ uses its Directory and Resource Administrator (DRA) as a proxy for Active Directory working outside of the directory environment. While that is a key architectural difference between the two, the delegation function is basically the same. DRA also offers data integrity by filtering content as it is created to make sure data are structured correctly.

Aelita will join the fray this fall with its Enterprise Directory Manager (EDM), which includes a feature called Managed Units. It lets administrators be grouped and assigned tasks, regardless of the organizational structure of the directory. EDM has a policy enforcement engine to ensure data integrity and consistency. Aelita also has a unique tool called ERDisk for Active Directory, which creates a backup copy of the entire directory, compresses the data and sends them to a central repository. The backup can restore the directory down to the individual object level.

BindView, with its bvAdmin for Win 2000 4.1, offers the same sort of role-

based delegation that supports all objects and attributes in the directory. But BindView, with its bvControl for Win 2000 and Active Directory, also provides tools for monitoring, reporting and security. The software monitors configuration and overall operation. It also can identify

security holes and take action to close them.

NetIQ offers similar monitoring and reporting functionality with DRA, and Quest is adding monitoring capabilities for Microsoft servers, but has yet to introduce an Active Directory module.

Also under the monitoring umbrel-

la, NetPro recently shipped Directory-Insight, which tracks the addition and deletion of objects in Active Directory.

All in all, the vendors are scrambling to offer suites of tools that will help IT administrators manage directories just as they manage other key pieces of their networks. ■

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Third parties to the rescue

A look at third-party directory management tools for Novell Directory Services eDirectory and Microsoft's Active Directory Services.

BY DENNIS WILLIAMS, NETWORK WORLD GLOBAL TEST ALLIANCE

can be a bear to manage. Today's leading network operating system vendors, Microsoft and Novell, are making strides to improve their directory management capabilities, particularly in the area of Web-based management. • But third-party vendors have stepped up and are offering tools that make directory management easier, more accessible and more powerful. This roundup will focus on specific third-party products designed to help you manage your directories.

bvControl for reporting

We liked bvControl because of its simplicity and effectiveness. Unlike other products that try to do everything, bvControl does one thing and does it well.

The bvControl suite has a universal core console that's consistent across Windows 2000, Active Directory, Novell Directory Services (NDS) eDirectory, Exchange and Unix. The centralized console lets you build queries and work with the results.

For example, if you can run a query to create a list of user accounts that need to be disabled, you can act on that result set within

the console and disable the accounts from the report.

The console makes it appear that all the data across the company are in a database — a virtual database of your corporation. For Active Directory Service (ADS) there are 100 fields, while for NDS eDirectory there are more than 3,000.

The bvControl console is a Microsoft Management Console (MMC) snap-in, and there's also a new Web-based front end. The console provides the ability to export, print and format data. It's not just a report-generating system. You can build a query using exception reporting, or there are many predefined reports

included. Active Directory has 200 reports, and NDS eDirectory has 600 to 800.

BvControl uses pick lists, so there's no query language to learn. Just specify what you want — such as a list of users, groups, services, events in event logs, machines, files, directories that meet/don't meet certain criteria or to which a user has access. Filter criteria can be simple or complex.

BvControl has a few components that, if installed on a single server, require a beefy machine. So to maximize report-generating performance, bvControl is scalable, with multiple servers capable of gathering information across the corporation. You can install agents, or services, on the servers, letting them gather information. It doesn't matter if you have a heterogeneous environment. The bvControl console is designed to talk to them all.

DRA for automating tasks

NetIQ's Directory Resource Administrator (DRA) is an automated administration tool for Windows NT4 and Windows 2000 Active Directory that enhances security and offers policy enforcement. It is ideally suited for companies running Win 2000 and NT, integrating the management of both platforms.

With DRA, you can distribute or delegate the administration of NT4 or ADS users with trusted delegation. So instead of having to perform all the administrative functions such as resetting passwords

and entering user information, you can delegate them to someone else.

We used DRA to simplify complex, multistep tasks such as automatically filling in user information by gathering it from other data sources on the network. When any-time data is entered into ADS, DRA protects the integrity of that data. It validates information such as phone number format, departments that are misspelled and other mishaps that render the data in your directory less effective.

Because DRA can enforce policies on field content, you can safely distribute administration of those properties to your user community. Crucial to distributing administration is making sure that delegates can only input valid data. A user who only has the authority to reset passwords will only be allowed to see that one task.

We liked DRA's ease of use and its Web console. If you're going to get users involved in network administration, DRA makes it easy and secure. Not only is its Web console easy to use, but the entire package is also easy to implement. The only caveat in DRA is its ties to Microsoft's NT4 and ADS environments.

NetPro: for health monitoring

NetPro has four directory management products — two for NDS eDirectory and two for ADS.

DS Expert is a proactive tool that continually monitors the health of NDS eDirectory.

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Directory Management

If it senses an impending problem, it will alert the network administrator of the condition.

NDS eDirectory includes tools to manage its health, but you must run them manually. DS Expert automates this process by continually monitoring more than 30 critical conditions within NDS eDirectory and helping prevent directory-related problems such as replication process errors, stuck obituaries, invalid external references, time synchronization errors, schema sync errors and invalid back links. These conditions, if left unchecked, can bring NDS eDirectory, and your entire network, to its knees.

The longer you run NDS and the more servers you add to your network, the more useful DS Expert will become.

DS Analyzer helps optimize NDS eDirectory performance while minimizing unnecessary traffic on the network. It monitors and analyzes the network traffic generated by NDS eDirectory and displays statistics on the results.

More than just a troubleshooting tool, you can use DS Analyzer to tune NDS eDirectory for optimal performance. It gathers directory traffic and bandwidth utilization data from across the entire network and displays it in a graphical format, letting you quickly analyze the directory traffic impact on your network.

DirectoryAnalyzer is the ADS equivalence of DS Expert and DS Analyzer, providing monitoring and troubleshooting capabilities for ADS. It proactively monitors ADS performance and critical components, including domain controllers, domains, sites and some DNS functions.

You have to pay close attention to the installation and configuration of DirectoryAnalyzer because different software agents have to be installed to specific servers.

The agents report back to the main console, which shows the different alerts and their severity. Upon installation, we were immediately shown several alerts that DirectoryAnalyzer showed to be latency issues.

DirectoryInsight is a unique tool, providing change and configuration management for ADS. Unlike the other tools from NetPro that manage physical aspects of the directory, DirectoryInsight manages the directory content. It helps you deploy ADS and provides ongoing management capabilities.

It tracks the population of directory objects and records how directory objects populate over

time, letting you keep ADS change under control throughout deployment and beyond. It also eliminates manual change log processes and object counts, and provides instant access to a central repository of change data.

NetPro's NDS eDirectory and ADS tools can add benefit to even the smallest of networks. However, they are most valuable in large, multiserver environments where the number of servers exceeds your capacity to conveniently touch them all.

ERDisk for file recovery

Aelita's ERDisk for Active Directory is a unique tool by providing centralized, automated emergency repair disk (ERD) creation and fast recovery from configuration problems. It claims a 10-minute recovery of system files, and our tests came pretty close.

There are two versions of ERDisk — one for Win 2000 and NT systems, and another for ADS. While it doesn't back up your data files, the need to back up system files and directory files is just as important.

A new ERD must be created each time you make changes to the system configuration. These changes include installing a new application, installing a service pack or changing partition information on the server. ERDisk tracks and manages the ERD information and stores it centrally

on the network.

With ERD data saved to the network, ERDisk provides a fast recovery of network servers from a centralized, remote management point. ERDisk also provides remote, unattended recovery of failed systems, as well as the recovery of unbootable systems.

With ADS, if information has been corrupted or inadvertently deleted or modified, you can use ERDisk for ADS to restore it in a matter of minutes without requiring that the domain controller be restarted. You can specify the information you want to restore — just a few objects or the entire directory database. ERDisk works by creating ERDs for specified computers on the network and storing the information in a central location.

We found ERDisk to be another useful tool to hang on our tool belt. Those most interested in ERDisk might be people who have been burned by not keeping their ERDs up to date. It adds a little more peace of mind in an insecure world.

Active Roles for policy enforcement

Formerly FastLane Technologies, Quest Software's products still retain the FastLane name. FastLane Active Roles for ADS is an enhanced policy enforcement and delegation tool that uses Microsoft's graphical MMC

interface for its roles-based administration model. Active Roles derives its name from the logical administrative roles assigned to ADS users.

Active Roles was built specifically for ADS, and all the Active Roles definitions are stored in the directory. This lets the Active Roles data be replicated natively with ADS. You can create functional, departmental or other custom views of ADS objects, which can then be delegated to appropriate help desk staff or to remote administrative staff.

We tested Active Roles by deploying administrative roles to enforce directory permissions based on our business requirements.

We could view and manage the currently deployed ADS permissions or consolidate specific Access Control Entries from the ADS delegation model into logical roles (or Active Roles) that meet the business requirements of our company. These roles can be deployed, reused or edited.

It's quick and easy to set up and run Active Roles, but using it takes some getting used to.

We found that we had to follow the documentation closely to accomplish many common tasks. The mindset of the program was somewhat counterintuitive.

PatchLink for Web interface

PatchLink offers a handful of

• **bvControl for Active Directory 7**
• **bvControl for Windows 2000 v7**
• **bvControl for NetWare and NDSv7**

COMPANY:BindView, (800) 813-5869, (713) 561-4000, www.bindview.com
COST: \$695 per server and \$95 per workstation
PROS: Available for a variety of platforms; powerful reporting capabilities.
CONS: Only handles reporting; no Web interface.

• **Directory Resource Administrator (DRA) 6.02**

COMPANY:NetIQ, (888) 323-6768, (408) 330-7000, www.netiq.com
COST: \$1,600 per 100 users
PROS: Excellent delegation, policy enforcement; recycle bin for deleted users.
CONS: Works with Windows NT and 2000 systems only; limited function Web interface.

• **DS Analyzer 2.0**
• **DS Expert 3.2**
• **DirectoryAnalyzer 1.1**
• **DirectoryInsight 1.0**

COMPANY:NetPro, (800) 998-5090, (480) 941-3630, www.netpro.com
COST: DS Expert \$12 per user, DS Analyzer \$12 per user, DS Analyzer and DS Expert \$18 per user, DirectoryInsight \$5 per user (\$3 per use through Aug. 31), DirectoryAnalyzer \$12 per user
PROS: Excellent maintenance of directory health; thorough knowledge base; works with NDS eDirectory and ADS.
CONS: None.

• **ERDisk for Active Directory 1.0**

COMPANY:Aelita, (800) 263-0036, (614) 336-9223, www.aelita.com
COST: \$99 per server license or \$10 per workstation
PROS: ERD creation and automation.
CONS: No additional functions.

• **FastLane Active Roles 3.0.0**

COMPANY:Quest Software, (949) 754-8000, www.quest.com
COST: \$15 per managed user, with quantity pricing available
PROS: Role-based administration aids in delegation and policy enforcement.
CONS: Interface is counterintuitive, requiring constant reference to documentation.

• **WebConsole for NDS eDirectory**
• **WebConsole for Active Directory**
• **DS Doctor 4.04**

COMPANY:PatchLink, (888) 970-1025, (480) 970-1025, www.patchlink.com
COST: DS Doctor \$250 for 50 users
PROS: Web-enables NDS eDirectory and ADS object management tools; PatchLink Update makes maintaining software version consistency networkwide simple.
CONS: DS Doctor is limited in functionality.

directory-enhancement products that make ADS and NDS eDirectory easier to use, including:

- WebConsole for NDS eDirectory and ADS provides a Web interface to the existing management capabilities of each system. The Web interface is new, but the functionality is the same that

you're accustomed to seeing. You can still manage the directory, users and groups, run diagnostics or manipulate files. All you need is an Internet connection and you can manage your NetWare servers.

WebConsole also supports delegated administration, letting you delegate spe-

cific management tasks to network users. Users will likely find it easier to use the Web interface than ConsoleOne, and all you'll need to give them is the URL.

WebConsole should be installed on every NDS eDirectory and ADS server on your network that you want to man-

age from a Web interface. The installation isn't hard, but is a little drawn-out and takes more time than expected. But the result is a Web interface to all your favorite NDS eDirectory and ADS management tools.

We were wowed by WebConsole. It's a simple concept, but it is so useful. It extends the reach of network administrators to anywhere there's a browser, and its simplified interface makes delegated management tasks easy for non-technical users. WebConsole works with NetWare, Windows NT/2000 and Unix.

- DS Doctor v4.04 monitors the health of NDS eDirectory. An add-on to WebConsole, DS Doctor monitors server partitions and lets you repair and synchronize NDS eDirectory trees remotely. It's Web-based, so you can run it anywhere there's a browser. It continually monitors the directory.

While not as full featured as NetPro's DS Expert and DS Analyzer, its Web interface provides a unique advantage for those with simple needs.

- PatchLink Update 3.0 does for NDS eDirectory and ADS what Windows Update does for your Windows desktop — it detects software product versions on all your networked systems and provides the means to correct them.

PatchLink Update works by scanning the network and detecting the software versions on each computer. You can compare the results and determine what software version you want and to which computers you want to deploy that patch.

You can provide software updates for a variety of applications such as Win 2000 Service Pack 2, Office 2000 Service Pack 1 and so on.

PatchLink's tools are unique in their Web-enablement of NetWare management and diagnostic capabilities. By extending core NetWare management functionality to the Web and providing additional value, PatchLink tools are ideal for companies needing to remote-enable their management platforms. We liked their products and the simplicity they bring to the complex task of network management.

Conclusion

Novell and Microsoft are making their directories easier to use. Both are just now starting to Web-enable their management tools like WebConsole. But they still don't offer directory health monitoring like NetPro, nor can they enforce data entry integrity like DRA. And they don't offer powerful reporting capabilities like bvControl or let you undelete user accounts like DRA.

Williams, a member of the Network World Global Test Alliance, is the director of ProductReviews.com in Alpine, Utah. He can be reached at Dennis@ProductReviews.com.

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Gigabit switches are the engines of large enterprise LANs. But even midsize companies are feeling the LAN bandwidth pinch and retooling their networks on Gigabit infrastructures. This represents a new and rapidly growing market for Layer 2 and Layer 3 Gigabit switches.

This market includes Cisco's new Catalyst 3550-12T and 2950T-24 switches, which were introduced in May. We recently tested these switches and found they delivered at or near wire-speed Gigabit performance over Category 5 unshielded twisted pair copper cabling. They also support a full complement of features and a new management graphical user interface (GUI) — all for a competitive price.

Overall, we awarded the switches top ratings, although the management GUI has a few kinks.

Just inches from full wire speed

The Catalyst 3550-12T and the 2950T-24 are excellent performers, delivering wire-speed throughput with only a few exceptions. (See "How we did it," DocFinder: 5527.) When we tested using minimum-sized 64-byte packets on the 3550-12T and full-duplex load on all 12 Gigabit ports, performance dipped slightly below 100%, to 92.32% of line speed in Layer 2 tests (media access control-layer switching) and 91.98% of line speed at Layer 3 (IP routing). Throughput tests performed with smaller packets apply the maximum workload on Layer 2/3 switches, and it's where throughput shortfalls typically occur. When we ran the 64-byte packet throughput tests on the 3550 using 10 (instead of 12) ports of full-duplex, Gigabit-rate traffic, we saw 100% line-rate throughput. This throughput performance more than adequately met the requirements of most midrange company LANs.

We measured latency, which was acceptable on both switches at less

Gigabit switches for the midrange

Cisco's Catalyst 3550 and 2950 switches target midrange Layer 2/Layer 3 market.

BY EDWIN MIER, BETSY YOCOM AND MARC FRIGO, NETWORK WORLD GLOBAL TEST ALLIANCE

than a millisecond of delay on traffic passing through the 3550.

New midrange management

As Cisco has oriented these switches toward the midrange customer, it had to design a management that's less daunting than Ciscoworks 2000 and Cisco's command line interface (CLI). The result is the Cluster Management Suite (CMS), Cisco's take on the right mix of network management features and depth for this midrange environment.

CMS is a set of Java applets accessed via a Web browser (we used Internet Explorer Version 5.0), plus all the add-ons in the Java 2 Runtime Environment. The typical midrange customer would deploy at least one 3550 multilayer switch and some number of 2950 switches. The 3550, designated the "cluster command switch," becomes the network's focal point.

The administrator browses into the 3550 command switch to manage the whole cluster.

CMS comes close to hitting the mark as a simple, yet functionally adequate, management tool. Cisco could add some features, such as an alarm/event log. Currently the switches can issue SNMP traps out to a third-party SNMP manager, but there's no component for retaining or logging such events, alarms or traps.

Overall features and functionality, though, are just OK. Our so-so rating of management is based more on CMS operational issues. One major gripe is it takes a long time to load all the applets and for the interface to come up. And CMS remembers nothing from your last session. All the tweaking made to highlight specific interfaces or format graphs in your last management session is lost after logging off and browsing back into CMS or rebooting the switch. Because this version of CMS is new, it needs some fine-tuning before it will fly right.

There's also no real-time monitoring. None of the statistics update in real time; you have to manually refresh the screen for current data. And refreshing any statistic takes slightly longer than 5 seconds from a 3550, and more than 15 seconds from a 2950. Java brews slowly.

Statistics are displayed in one table for all switch interfaces at the same time. Refreshing updates for all the interfaces in the table concurrently, making it hard to focus on activity for a particular interface. You can graph activity on a particular interface, but the detail is not granular nor modifiable. The update frequency is also slow and occurs at erratic intervals.

Despite this, CMS' statistics are, for the most part, accurate. However, when the 3550's Gigabit ports are

under heavy load, their traffic statistics often go awry.

The 3550 and 2950 perform well as Layer 2 switches out of the box. Configuration of the 3550 for routing is straightforward via CMS GUI. We've traditionally ranked a Cisco router configuration via CLI a 7 on a 10-point scale, where 10 is most difficult. A 3550 router configuration via CMS brings the technical difficulty down to between a 5 and 6.

Fully-featured and reliable

The 3550 and 2950 switches are designed to work together. The 3550-12T provides 10 fixed-configuration 1000Base-T, Gigabit-over-copper ports plus two gigabit interface card slots, which yielded two more 1000Base-T ports, for a total of 12. It can work alone, providing high-capacity Layer 2 or Layer 3 networking to server farms, or can provide for high-capacity interconnection of multiple Layer 2 Catalyst 2950T-24 switches (usually in wiring closets). The 2950T-24, a fixed-configuration switch, supports 24 10/100 ports and two Gigabit-over-copper "uplink" ports. The Gigabit ports on both switches operate over existing Cat 5 cabling, so do not require installation of optical fiber.

Typically, products lose points if they're not modular, but for midsize companies with modest technical staffs to install and maintain systems — the products' "fixed" nature is appropriate. Besides, up to 16 switches (3550-12T's and/or 2950T-24s) can be stacked in a cluster and managed via CMS.

Both switches support the full range of features typically found on Layer 2 switches — including Spanning Tree Protocol and virtual LAN support. The 3550 also supports full Layer 3 switching, including dynamic and static IP routing. Quality-of-service features are extensive, including 802.1p and q, strict-priority, weighted round robin and other IP-prioritization mechanisms. Reliability and redundancy features include support for Cisco's Hot Standby Router Protocol on the 3550-12T.

Conclusion

These switches pack a lot of power and are fairly easy to install and maintain. Competitively priced at \$10,000, the Catalyst 3550-12T and its Catalyst 2950T-24 counterpart are ideal products for building Gigabit infrastructures in midrange companies.

Mier is founder, Yocom is senior editor and Frigo is test engineer at Miercom in Princeton Junction, N.J. They can be reached at ed@mier.com, betsy@mier.com or ufrigo@mier.com.

NetResults

Cisco Catalyst 3550-12T and 2950T-24

RATING: 4.15 **COMPANY:** Cisco, (408) 562-4000, www.cisco.com **COST:** Cisco Catalyst 3550-12T costs \$10,000 (\$833 per port); Cisco Catalyst 2950T-24 costs \$2,400 (\$92 per port) **PROS:** At or near wire-speed performance; fully featured; easy to install; competitively priced. **CONS:** Some operational issues on the new CMS; no real-time monitoring.

	Performance 30%	Management 25%	Features 25%	Installation, Ease of use 10%	Configuration 10%	Total score
3550-12T and 2950T-24	5	3	4	4	5	4.15

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score. Scoring key: 5: **Exceptional showing** in this category. Defines the standard of excellence; 4: **Very good showing**. Although there may be room for improvement, this product was much better than average; 3: **Average showing** in this category. Product was neither especially good nor exceptionally bad; 2: **Below average**. Lacked some features or lower performance than other products, or than was expected; 1: **Considerably subpar**, or lacking features being reviewed.



Management Strategies

Career Development, Project Management, Business Justification

Noncompete or not?

Noncompete agreements can keep IT talent from flying the coop and singing about your trade secrets.

BY BONNY GEORGIA

Id you sign on the dotted line when you were hired? Do you make all employees sign their lives away, too? Once reserved for product development and engineering areas, more and more IT managers are using noncompete and nondisclosure agreements throughout their departments to avoid losing key employees to the competition and to protect against theft of source code or other intellectual property.

Emily Geneva Finan is a technology project leader with Bounty Systems, a privately held start-up that develops marketing referral and campaign management software in New York. Like many other IT managers, Finan requires new employees to sign a non-compete agreement (NCA). Under the terms, new hires can't work for the competition and are barred from working on other referral programs or campaign management software for two years after they leave the company.

Finan sees the policy as good business practice. "[NCAs] show we are a serious company that has taken an interest in protecting our corporate assets. It is also a question that investors ask when they are deciding to invest in the company. They see it as protection, that their investment in our company can't be lost simply because a key employee walks away and decides to set up a competing business," Finan says.

However, there can be backlash against NCAs, especially when the competition for skilled IT talent is high. Jeff Braswell is vice president of network operations at e-Media, a streaming media services provider in Stamford, Conn. When the firm launched two years ago, all executives and IT staff were required to sign an NCA as a condition of employment. Despite the desire to protect its proprietary streaming media technology, the company quickly abandoned noncompetes when it became clear that new talent was put off by the policy.

"At that time, it was an employee's [job] market. The opportunity to change jobs for a substantial increase in salary, or at that time, equity stake, was too great to get locked into an agreement that kept them tied to a single company in the area. It didn't take long for us to realize [NCAs] were not being received well by people we were trying to attract, so we stopped using them," Braswell says.

Any time you have staff with access to trade secrets — product codes, customer files or other confidential data that give your business an edge and that you wish to keep secret — it's worth considering a noncompete or nondisclosure agreement, advises Bill Ejzak, an attorney with the Chicago law firm of Schuyler, Roche & Zwirner, which specializes in trade secret protection.

But if you plan on enforcing the NCA in court, boilerplate documents are a big no-no. Courts typically toss these one-size-fits-all agreements out because they are too vague. Judges evaluate noncompetes on the criteria of reasonableness, the scope of activities prohibited, duration of the agreement and geographic territory limitations. The most enforceable NCAs define specific tasks for an employee and spell out exactly what they are prohibited from doing in the future.

"You can't just tie people up with an NCA. There has to be a legitimate business interest. If you have someone writing source code for you, have a restriction there, but don't restrict them regarding marketing activities or other areas outside of their typical area of work. You can't prevent someone from working as a programmer or drafter of source code everywhere, but you can probably prevent that employee from developing the same type of code they're working on for you. The trick is to protect your trade secrets without hobbling the person's future employability," Ejzak says.

Another potential stumbling block is the difference in NCA enforcement from state to state. States such as California and Georgia make it difficult for employers to enforce NCAs as written, while Minnesota historically comes down on the side of businesses in disputes. "Pay attention to where you do



business, what areas you want to protect, and work with experienced legal counsel who can tell you what has been enforced in the past," Ejzak says.

Tom Thrower, general manager of Management Recruiters International of Oakland, Calif., offers this advice: "Companies really need to look at who they want to enforce [an NCA] with. With your high-end people — directors of engineering, designers and other IT people who may hold the keys to specific sensitive info — you should take steps to ensure you are protected. But remember, if you are trying to legislate too much morality, you put yourself in a situation where no one obeys the law."

Braswell adds, "Make sure the noncompete agreement makes sense for your scenario. When you're dealing with [research and development] or proprietary technology, it's something worth protecting. In the end, you need to consider the market you're in and the kind of technology you're trying to protect, and weigh that against your need to attract quality talent."

Georgia is a freelance writer in Hudson, Mass. She can be reached at bonny@wordsatwork.net.

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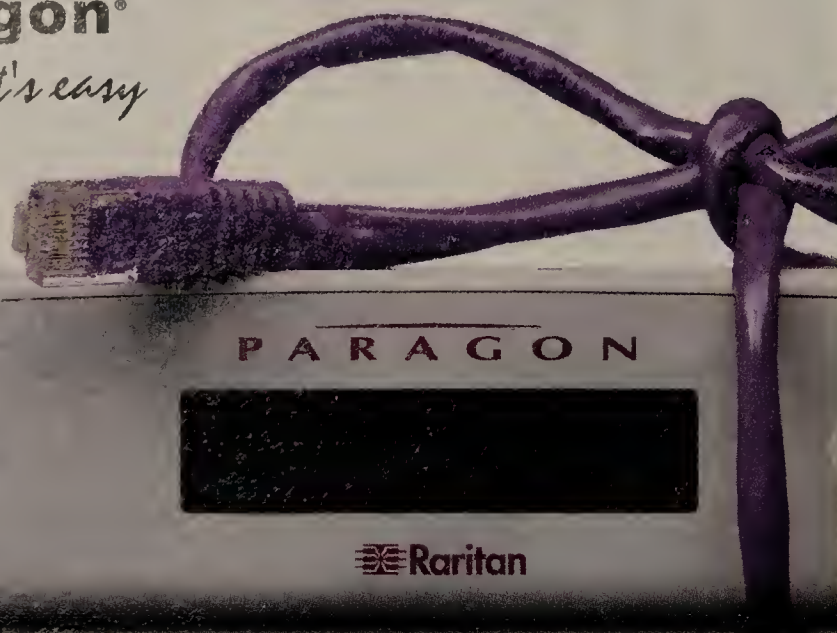


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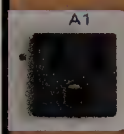
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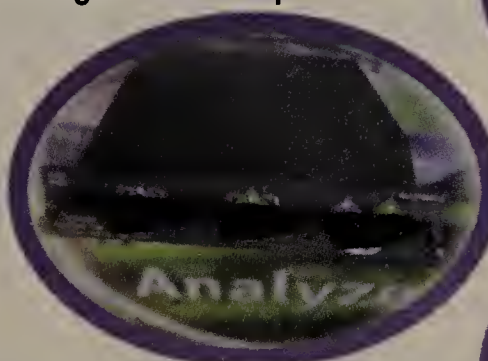
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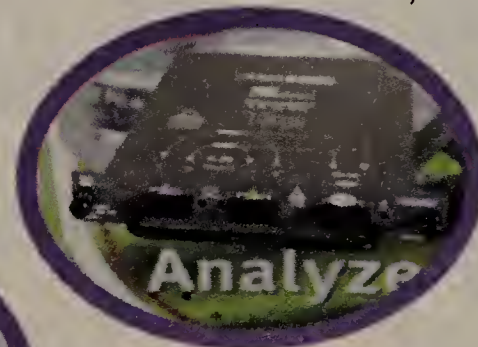
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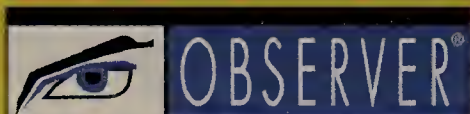
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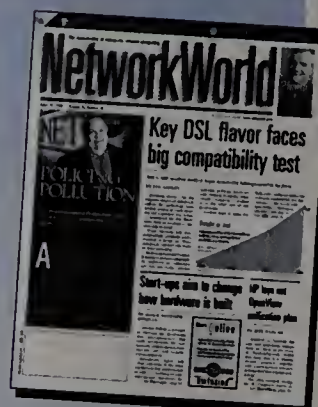
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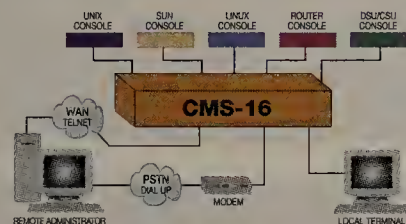
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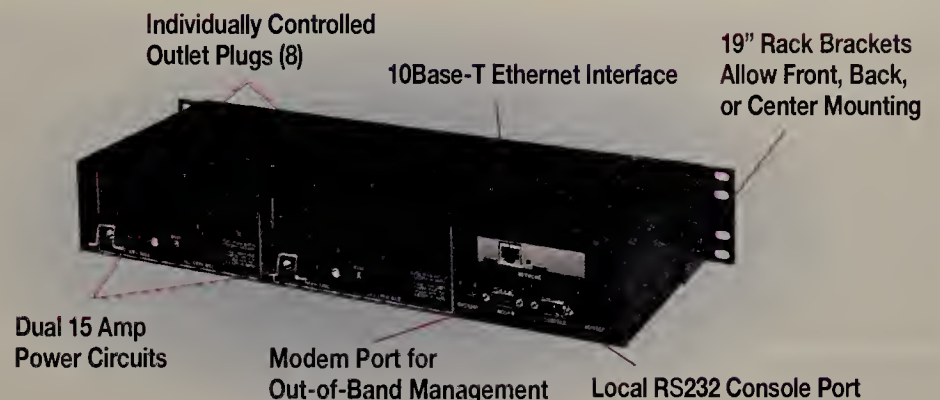


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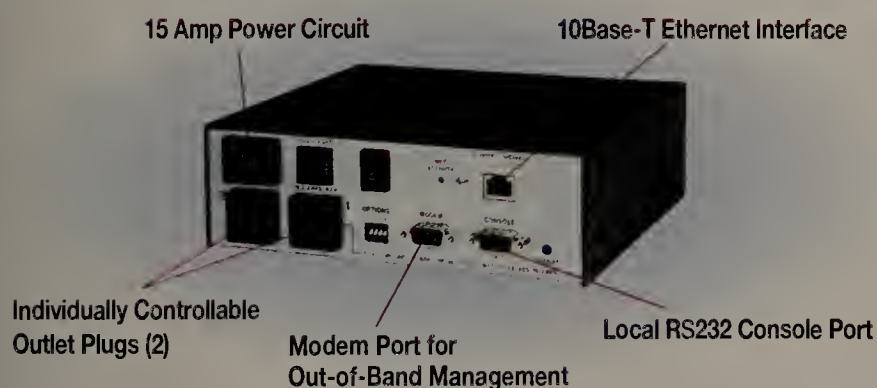
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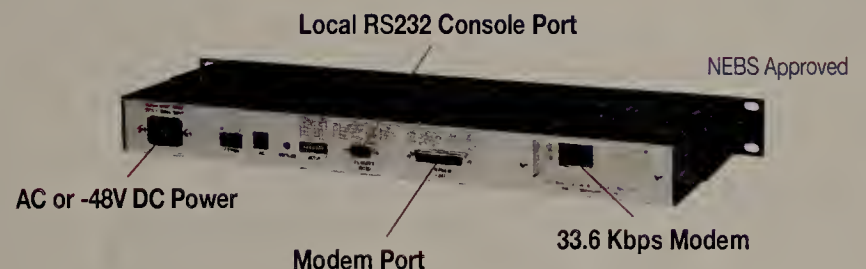
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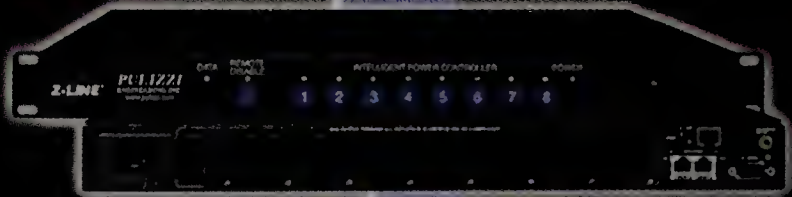
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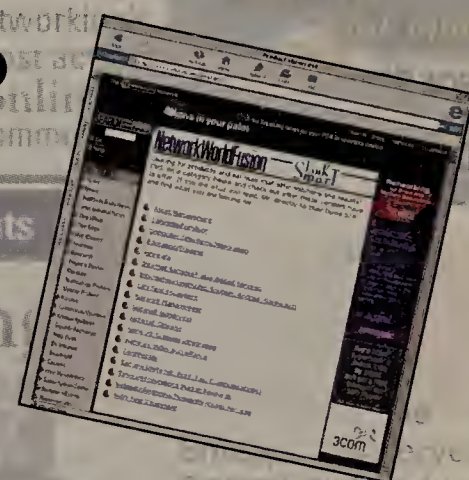
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IP Network Engineer (Atlanta, GA): Design, configure, manage, troubleshoot & streamline the company's IP network. Design, manage & troubleshoot the BGP & OSPF network routing policies. Provide technical guidance, direction & training to other network engineers & 2nd level support to the NOC. Establish dept. policies & implement required procedures for IP network. Work w/the planning dept. to create & maintain a network plan. Review, approve & manage the IP vendors & work w/other Telecom Carriers & Internet Service Providers. Req. B.Sc. in Computer Engineering or its foreign degree equivalent plus 2 yr. exp. in job offered. Resume to: Joan Tolliver, VP of HR, Cbeyond Communications, 320 Interstate North Pkwy, S.E., Suite 300, Atlanta, GA 30339.

Web Developer (Melrose Park, PA) Designs software & internet applications; creates forms using HTML, DHTML, XHTML & Javascript, displays data using XML & XSL from DB2. BS/BA Comp. Info Systems, Business Admin + 1 yr exp. Fax 215-782-2083 Ref HB.

Sr Java Developer(3 positions available). Design & develop s/w based on coding stds; design OO modeling diagrams; use EJB, Corba, Servlets, & other J2EE or J2SE components to implement architecture reqs; review & edit UML documentation; run blackbox, whitebox, & regression testing on s/w modules; & use s/w repository sys to maintain code revisions. Req: B.S., Comp Sci (or equiv education/training) & 5 yrs exp in: 1) development; 2) OO technologies; 3) using Java to implement OO s/w sys or components; & full life cycle development. Exp. may be gained concurrently. Send resume to: Linnea Gambino, Incellico, Inc., 2327 Englert Dr., Ste 205, Durham, NC 27713, or call 919-484-7222ext. 232.

F/T Senior Database Analyst. Design & implement complex oracle data structures as well as 24x7 production support of Oracle data structures. Analyze & resolve complex problems in mission critical Oracle environments & maintain Oracle databases using Oracle Enterprise Manager & BMC Oracle Utilities. Must have Bachelor's degree or foreign degree equivalent in Computer Science or related field. Must have 5 yrs. exp. in job offered or position w/ same duties. Send resume, indicate job code: IDD-CW8/13/01 to sras@ups.com or United Parcel Service, P.O. Box 833, Mahwah, NJ 07430, Attn: Sneron Ras - Human Resources, R2A-026

Sinoma Consulting, Inc., an information systems consulting services company, is looking for candidates to fill the following positions:

Senior Development Consultants

Senior Development/ Database Administration Consultant

If you are interested, please send your resume to Alex B. Vilner, President, Sinoma Consulting, Inc., 8-d Overlook Circle, Smithfield, RI 02917.

Sr S/W Engineers to lead teams to analyze, design and develop OLTP systems and data warehouses/data marts; business information modeling, logical & physical data & process modeling using ERwin, Visio, BRIO, Informatica, Oracle, MS SOL Server, & VB; or analyze, design and develop in multi-tier architecture and Internet based Market Exchanges (B2B & B2C), database design, using Oracle, ERwin, Developer/2000, Visual Interdev, Rightworks, ASP, JSP, XML & XSL. Require: MS in CS/Engg (any branch) with 3 yrs exp in the job offered. BS or foreign equiv with conc. in CS/Engg (any branch) plus 5 yrs of progressive exp will also be accepted. 80% traveling required. Highly competitive salaries. Resumes to: HR, Mindspace Systems Inc., 6050 Peachtree Parkway, Suite 240-214, Norcross, GA 30092.

F/T Engineering Account Manager. Negotiate & manage contracts w/ clients & system integrators in the telecommunication industry & provide technical support to clients throughout the software implementation process. Using GISCOM software prepare project work plans, schedules & monitor budgets. Recruit, train and oversee personnel responsible for development enhancements and release upgrades. Must have Bachelor's Degree in Computer Science, any Engineering discipline or related field. Foreign degree equivalent accepted. Must have 5 yrs. exp. In job offered or position w/ same duties. Salary: \$85,000. Send resume to Betsy Moya, Sema, 701 Waterford Way, Ste. 300, Miami, FL 33126.

F/T Software Engineer. Resp. for creating Functional Specification documents based on design requests & producing & implementing High Level Designs for assigned functional areas. Perform unit testing on developed codes & troubleshoot defects found. Design & implement new modules in client server & Java environment & maintain server modules written in C. Provide technical support to clients, evaluate business requirements & develop software & documentation according to established standards using UNIX, Pro*C & ORACLE. Must have Bachelor's degree in Computer Science, and Engineering discipline or related. Foreign degree equivalent accepted. Must have 2 yrs. of exp. in job offered or position w/ same duties. Salary: \$62,915-64,000. Send resume to Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, Florida 33126.

SAP Consultant
Atlanta, GA

Design, develop, implement, test, support and maintain cost accounting and logistics application software for finance, controlling, sales and distribution, materials management and production planning systems using SAP software tools. Requires a Bachelor's degree (or foreign equivalent) in Computer Science, Business Administration, Business Information Systems or a closely related field with 3 years experience in the offered position or as a Software Consultant or Programmer/ Systems Analyst. Experience must include 1 year implementing systems using SAP. Salary: \$75,000 per year. Hours: 8am to 5pm, M-F. Send resume to: ATTN: JOB MK, Corporate HR, Plaut Consulting, Inc., 1050 Winter St., Suite 2300, Waltham, MA 02451. (No Phone Calls Please). EOE.

IT Professionals

Entergy, one of America's largest utility companies, has multiple openings for the following occupations in multiple locations:

- Information Technology Professionals
- Systems Analysts
- Computer Programmers
- Software Engineers

For immediate consideration, please forward your resume and salary requirements to: Entergy Corporation and operating subsidiaries, Attn: Ms. Lori Hendler, HR Department, PO Box 61000 New Orleans, LA 70161. Phone: 504-576-4117 EOE/M/F/D/V Principals only. You will only be contacted if you are considered for an interview.

Systems Analyst. Analyze & document customer's systems needs through workflow diagrams & applic screens; dsgn & dvlp custom acctg systems, incl investment, following US GAAP guidelines. B.S. in Comp. Sci., Eng. or related field such as s/ware dvlp or similar duties under different job title. Two yrs exp must incl working w/one or more of following dvlpmt tools MS Visual Studio, MS Visual Studio, NET, MS SQL Server, MS Visual C++, MS Visio. MS Certified Prof'l reqd. Demonstrated bus. communication & writing skills. 40 hrs/wk, \$45K/yr. Must have proof of legal auth to work in US. Send your resume to IA Workforce Center, 215 Watson Powell Jr. Way, Des Moines, IA 50309-1727. Please ref JO# IA1101433. Employer paid ad.

Computer Systems Analyst - Sioux Falls, SD: Install, customize, and maintain Customer Information Control System (CICS) software and other associated vendor products. Perform complex computer systems diagnosis & resolution, measurement & tuning to optimize online system efficiency. Prepare workflow charts and diagrams to assist programmers in areas of application and system design, coding, testing, and troubleshooting. Writes detailed description of user needs, program functions & steps required to develop or modify computer programs. Develop custom software as needed to enhance CICS. Conduct studies pertaining to development of new information systems to meet current & projected needs. Plans and prepares technical reports. Upgrades systems & correct errors to maintain system after implementation. Bachelor of Science in Computer Science & 2 years experience in offered job. Fax resume and cover letter to: Attn: R. Rogers; 605-330-6799. No calls please.

EpicEdge is seeking Java Developers/Sr. Java Developers. Requirements include BS/MS or equivalent. Java, Commercial Application Server and Integration experience required. Client/server experience needed.

For consideration email or mail your resume by August 27th to jobs@epicedge.com or to Epic Edge, Human Resources, 5508 Highway 290 West, #300, Austin, TX 78735. Positions are located in Seattle, Washington. No relocation assistance provided. Absolutely no agency inquiries accepted. Only qualified candidates will be contacted.

Network Administrator/Web Master. Install, configure & support Internet systems for web-based dvlpmt projects; participate in system dvlpmt & integration; coord system & s/ware changes; act as consultant to clients on bus process improvements & technology enhancements; supervise network support & client/server specialists; train & manage team of prgmrs & graphic dsgnrs to dvlp applics for clients; make presentations to & maintain progress dialogue w/clients. MS in Comp Sci, Instructional Technology or rel field + 3 yrs exp in job offd or rel occupation such as Sysms Support Specialist or similar duties under different job title. 3 yrs exp in network admin, training & coordinating the work of other administrators & prgmrs to meet project deadlines; using NT Server, SQL Server, iHTML Server, Cold Fusion Applic Server, Photoshop, Pagemaker Illustrator & Quark xPress & object oriented prgmg techniques & languages incl Perl, HTML, Java, Cold Fusion, iHTML, & JavaScript; & in training & managing IT grp. Demonstrated presentation skills. 40 hrs/wk, \$52K/yr. Must have proof of legal auth to work in US. Send resume to IA Workforce Center, 122 Kellogg Ave, PO Box 410, Ames, IA 50010-0410. Please ref to JO IA1101430. Employer paid ad.

We're the world leader in helping customers companies stay connected. Over the phone, on the Web, by fax. Our customer relationship solutions enable businesses to interact with their customers on a personal basis. And that makes all the difference.

ACS Consultant/Software Engineer

The Developer Consultant provides services and technical support to clients through software application development. Responsible for analysis, design, coding, testing, and integration of complex software application solutions. Requirements include and MS in engineer/Computer Science/Information Systems, MBA or BS in these disciplines, plus 2-5 years of experience. Experience with database systems including DB2/2, Oracle, and Sybase required, along with knowledge of C, C++, Visual Basic, Client/server Win95/98/2000, and/or NT, and and/or UNIX. Knowledge of at least one network operating system (Novell, LAN Manager, LAN Server, Banyon Pines) necessary. Job locations are throughout the US.

Aspect offers outstanding career opportunities and a highly competitive compensation/benefits package. To forward your resume (referencing Job Code: ACS001/RIR/INFOW), e-mail: staffing@aspect.com; fax: (408) 325-2942; or mail: Aspect Communications, Attn.: Staffing Department, 1310 Ridder Park Drive, San Jose, CA 95131. EOE/AEE. www.aspect.com

Network Administrator/LAN Administrator wanted by Commerce, CA co. Monitor data comm. network to ensure avail. to all users and resolve problems; monitor modems and display screens of terminals to the main-frame to detect error msg which signal malfunctions in comm. software or hardware; trouble shoot related to network; set up routers for remote and local sites; update doc to record new equipment installed, new sites and changes to computer config; instruct user to resolve problems; maintain and monitor LAN and WAN networks; install and troubleshoot Novell 3.12; assist and instruct users. Requires MS in Computer Sci. or Computer Engineering & 1 year exp. Respond to: M. Meyers -Authentic Fitness Corporation - 6040 Bandini Bld. - Commerce - CA 90040 - USA

Info Systems

Missouri Botanical Garden Chief Information Officer for Information Technology

Missouri Botanical Garden, a world leader in discovering and sharing knowledge about plants and their environment, is seeking an experienced leader to leverage its investments in information technology.

This executive level position manages the infrastructural information technology efforts for the entire institution, develops and coordinates planning, procurement, and implementation activities related to the delivery of quality, seven-day information services for both the Garden's research mission and its business/operational aspects. The position reports to the Director of the Garden.

The leader we seek must have: a well developed set of communication and collaborative skills that enable the creation of a clear vision and priority scheme to enhance and provide added value to the Garden's investments in Information Technology; the ability to effectively select, develop, coach, and mentor an Information Technology team; and, multitasking ability that facilitates switching between longer-term strategic planning to multiple short-term implementation issues of Information Technology resource allocation and prioritization.

Position qualifications include a Bachelor's degree in computer science, Master's degree a plus, and seven-plus years relevant and increasingly responsible experience. Additional skills include a complete understanding of modern technology matters, to include: distributed computing and networking architectures in use today; awareness of modern System Administration tasks and responsibilities; experience with Application and Database design and creation methodologies; video and data communications architectures and trends; and, operational knowledge of typical data center operations, including tape back-up and disk storage practices.

We offer a comprehensive benefits package, including medical, dental, and life insurance, retirement and 403(b) with generous match. Submit resume, along with names and addresses of three references to **Missouri Botanical Garden, Human Resource Management, Attention: CIO-IT, P.O. Box 299, St. Louis, MO 63166, or to jobs@mobot.org.** Position is open until filled. Review of resumes begins immediately. Equal Opportunity Employer.



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APN Software Services, a S/ware Consulting Company seeks to fill the following positions in Newark, CA & unanticipated locations in the US:

Sr. Software Consultants (Multiple Openings)-Must have BS degree & 3 yrs experience.

Programmer Analyst (Multiple Openings)-Must have BS degree & 2 yr. exp.

Respond by resume to HR Dept., 39899 Balentine Drive, Suite 385, Newark, California 94560.

Programmer Analyst (2 positions)- Plan, develop, test and document computer programs, applying knowledge of programming techniques and computer systems. Will perform routine tasks and will work under close supervision while assisting staff. Work is closely monitored and reviewed for accuracy. Requires AAS Degree* in Computer Systems. *2 yrs exp may substitute for AAS. 5 day, 40 hr/wk, \$60,000/yr. Please mail resumes to Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number CO5001008.

Programmer/Analyst - Needed

to design & develop mainframe

micro computer-based applica-

tions & work on interface design

& development. Apply to HR, LG

Soft India Pvt. Ltd., 150 East

Brokaw Rd., San Jose, CA 95112.

Travel Agency seeks Sr. Web

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LLC, 2820 Camino Del Rio

South, Suite 300, San Diego, CA

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Manager of Business Systems needed, for evaluation and analysis of clients' business system. Process mapping to determine the need and feasibility of Information technology (IT) solutions and ERP (Enterprise Resource Planning) system. Planning and design of IT solutions for client. Management and implementation of software projects. Managing the software consultants. Preparation of business plans and strategy. Implementing ERP using various modules like BaaN Common, Finance, Manufacturing and Distribution. Implementation of ERP using BaaN IV b software and methodology such as BaaN Target, GDPM (Goal Directed Project Management) and tools such as BaaN Orgware & DEM (Dynamic Enterprise Modeling). Master's Degree in management Studies or Business Administration required plus 3 years experience in job offered or plus 3 years experience as Executive Director of Operations. Education or experience must include use of ERP (Enterprise Resource Planning) computer program. Annual salary \$83000.00; 40 hr. week. 8:00 AM-5:00 PM. Send resume and transcripts to MDCE/ESA, P.O. Box 11170, Detroit, MI 48202-1170. Ref. No. 200763. Employer paid ad.

EpicEdge is seeking qualified candidates for PeopleSoft HRMS and Financial implementations. Functional or Technical PeopleSoft HRMS or Financials experience required. PeopleSoft consulting experience desired. A BS/MS or equivalent experience is required.

For consideration email or mail your resume by August 27th to jobs@epicedge.com or to Epic Edge, Human Resources, 5508 Highway 290 West, #300, Austin, TX 78735. Positions are located in Austin, Texas Some travel required. No relocation assistance provided. Absolutely no agencies inquiries accepted. Only qualified candidates will be contacted.

SIU SOUTHERN ILLINOIS UNIVERSITY
EDWARDSVILLE

Financial Applications Analyst

SIUE wishes to fill a newly created position that will be the primary interface between its new Automated Information System (AIS) and its end-user community. AIS is based on the Oracle Government suite of financial applications including G/L, A/P, Purchasing and Fixed Assets. Responsibilities will comprise: assisting University departments in streamlining business processes, designing ad-hoc reports, assisting and training users, troubleshooting, eliminating shadow systems and, generally, maximizing the benefits to be received from AIS.

The position requires at least 3 years relevant experience working with integrated financial applications; a Bachelor's Degree in Information Systems, Accounting, Business Administration or related field; proven experience with spreadsheet applications such as Excel, and excellent written and verbal communication skills. In addition, experience with ad-hoc report generators, SOL and Oracle applications is preferred. Salary is commensurate with experience, however, the minimum salary is \$50,000 annually.

We are looking for a dynamic, creative, outside-the-box thinker who can make a difference. If you meet the needs of this position and want to be challenged to use all of your analytical and communications skills, please send or email a cover letter and resume to the following. Resumes will be accepted until the position is filled. SIUE is an EEOE.

Mr. Barry Greenberg
Chair, Search Committee
SIUE
Campus Box 1042
Edwardsville, IL 62026-1042
Email: bgreenb@siue.edu

IT Careers in Security

Anyone working with information technology knows that the issue of IT security continues to escalate. The exposure, risk and awareness are mounting as companies invest to maintain firewalls and assure that as new applications and networks come online, their integrity is protected.

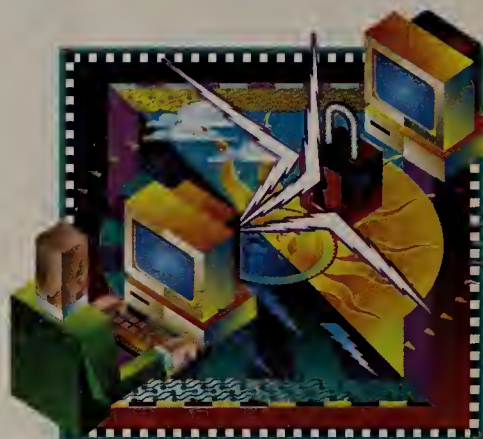
@stake, based in Cambridge, MA, is among the firms helping companies assess and address their IT security risks. According to IDC, Internet security services spending is projected to reach \$17.2 billion worldwide by 2004. James Mobley, executive president for the Americas, says @stake works primarily with financial services firms and large IT service providers to evaluate their networks and applications for possible security risk and on authorization systems that ensure users are who they say they are. @stake is also working with several insurance clients to help them assess the risk of a catastrophic break in a company's

network. The insurance companies will use the information to help in writing premiums.

"@stake works on interesting projects, and we're fortunate to play with clients who have complex business models," says Mobley. "We also help clients plan for what happens when they are attacked – their incident response readiness – and train and educate their employees about IT security."

To meet client needs, @stake is looking for people who have experience with security systems and who have deep technical expertise. "We also look for people who have a consulting profile," says Mobley.

Employees are supported through ongoing



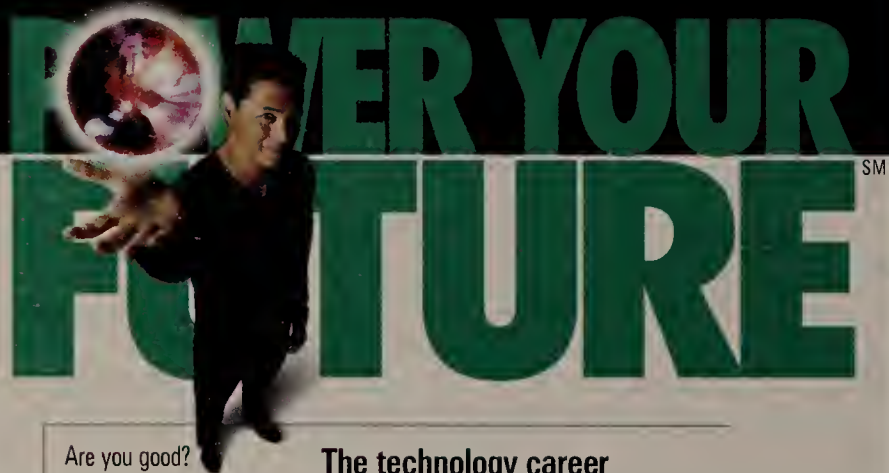
learning known at @stake as "learn and burn". Employees come together to do problem solving on a key business topic. "Culturally it helps everyone stay up to date on what is going on with the firm and to learn from one another. We pride ourselves on learning from the experts who are here," says Christina Luconi, chief people officer.

@stake has opportunities in New York, San Francisco and London. "You'll experience a blend of projects in your backyard as well as elsewhere," says Luconi. "Just as important, you will deal with the technological issues of today while also examining what the top technology security issues will be four to five years down the road. Thought leadership and research and development are hot with @stake."

For more job opportunities with security firms, turn to the pages of ITcareers.

- If you'd like to take part in an upcoming ITcareers feature, contact Jonis Crowley, 650.312.0607 or jonis_crowley@itcareers.net.
- Produced by Carole R. Hedden
- Designed by Aldebaran Graphic Solutions

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The MathWorks leads the market in developing and delivering high performance interactive software products such as MATLAB® to the engineering and scientific communities. We're increasing our lead by hiring the best people for every job in the organization. We have the following positions available at our offices in Natick, MA.

Software Engineer

Design, develop and test the MATLAB family of products. Programming experience in MATLAB, and/or C, C++, Java is required.

Communications Engineer

Develop and enhance state-of-the-art algorithms used to simulate and analyze advanced communications systems. Prior experience simulating communication systems using MATLAB. Strong theoretical knowledge of advanced communication systems and algorithms.

Software Engineer – Quality Control, PAGE QE

Develop test suites and conduct hands-on testing of the MathWorks applications products. Programming experience in MATLAB and/or C, C++, Java.

Software Engineer Real-Time Application Specialist

Develop next generation embedded real-time code generation product. Experience using Perl, M, C and TLC programming languages is required.

Senior Real-Time Software Development Engineer

Develop MATLAB and C code for new simulation and code generation applications of Simulink and interface automatically generated code running in real-time on The MathWorks' PC Target product. Experience with Real-time systems and C programming is required.

The aforementioned positions are available at all levels and require a minimum of a B.S. or M.S. in Computer Science, Engineering, Math or a related degree and 0-5 years experience with MATLAB, Simulink, RTW, Controls, or DSP Environments.

Senior Software Engineer with programming experience in MATLAB and/or C, C++, Java. Experience in Simulation, DSP, Image Processing or Controls is required. Ph.D required.

Additional Opportunities Include:

- Senior Accountant
- Financial Analyst
- Pricing & Licensing Specialists
- Graphics Developers
- Compiler Engineers
- Embedded Engineers
- Training Engineers
- Technical Writers
- DSP Simulink Developers
- Process Control Engineers
- Program Managers
- Technical Marketing Managers

For fastest consideration interested candidates should e-mail their resume, indicating position of interest to: resumes@mathworks.com. Attn: Human Resources — Job Code: IW7/01 The MathWorks, Inc., 3 Apple Hill Drive Natick, MA 01760-2098 Fax: (800) 434-8967

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IT Careers in Healthcare

Healthcare agencies and institutions continuously upgrade information technology to improve patient care and business operations. Frequently they turn to outside firms to develop the new applications and products to support their very human needs.

That's where **Siemens Medical Solutions Health Services Corporation** comes in. Based in Malvern, PA, **Siemens Health Services** is the worldwide headquarters for **Siemens'** healthcare information technology business and is the largest application service provider in healthcare. With more than 30 years in business, it currently hosts better than 1,000 healthcare organizations remotely out of its information services center. And, while many ASPs are struggling to hold a place in today's market, **Siemens** continues to grow and expand.

The IT organization is supporting two categories of work. On the customer side, **Siemens** IT pros develop leading-edge clinical, financial and administrative applications for more than 2,000 U.S. healthcare provider organizations. Internally, the IT group is renovating **Siemens'** architecture and introducing application portfolios for sales force automation and professional services.

Dave Rice, CIO, says the customer projects are organic development, requiring people who have skills in business systems analysis, programming and development, test and delivery. "We like to hire people who have experience in the healthcare industry," says Rice. "We also look at the continuity of your work experience and the diversity of your academic training – for instance, a technical degree paired with a master's in business."

On the internal side, Rice is hiring people to support integration, tailoring and implementation of

PeopleSoft's professional services portfolio and SIEBEL's sales force automation suite.

In addition to the technical skills required, Rice also considers whether prior experience has created a value to the business and what you've been able to accomplish under pressure. "I also look for information about the individual – whether you're active in your community and that kind of thing," adds Rice. That's important to the **Siemens** culture where the sense of community is a strength. "Healthcare and healthcare IT attract a certain type of person, someone who is rewarded by having a positive impact on human beings and who can see the greater good of our work."

Employees transfer easily between the customer and internal infrastructure support roles, and **Siemens** also has ISC, telecommunications and outsourcing business operations as career paths for IT professionals. As a division of **Siemens**, the company operates in 193 countries, offering employees a range of opportunities for global experience. "With **Siemens**, you have an opportunity to get varied experiences under the same tent," says Rice. "We believe in investing in people so that you can become part of a proud tradition."

For more job opportunities with healthcare firms, turn to the pages of **ITcareers**.

- If you'd like to take part in an upcoming **ITcareers** feature, contact Janis Crawley, 650.312.0607 or janis_crawley@itcareers.net.
- Produced by Carole R. Hedden
- Designed by Aldebaran Graphic Solutions

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IT careers

OFFICE AUTOMATION ANALYST. Job in North Richard Hills, TX. Analyze automation needs of the Co. & its customers to develop compatible computer systems. Consult w/cust to det computerized servs, prog & equipmt needed by that business or indiv. Negotiate fees for servs. Direct installation of comp, printers, accessories & S/W. Identify & solve problems for cust relating to comput equip. Program & activate comput equipmt & servs for customers such as e-mail, faxes, voice mail, pagers & cell phones to ensure proper performance. Superv & assist employees using comp to make intl & domestic shipping arragnmt & to prep business docs, modifying systems as needed to accomplish the task. 40 hrs/wk, M-F 10am-5pm, Sat 10am-3 pm. \$850/wk. Req: Bachelor's Degree or equiv in Management Info Systems or in Administrative Computer Systems + 2 yrs exp in the job offered or as Systems Analyst. Apply at the Texas Workforce Commission, Houston, Texas, or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701, JO# TX1102413. Paid by an Equal Opportunity Employer.

Network World - Manager of Database Technology -Southboro, Ma Job Requirements: Masters degree in electrical/electronics engineering or CS, or alternatively a Bachelor's degree in the same and 5 years of progressive IT experience as a database architect or team leader working on disk space management and data retrieval. Must have knowledge of an Oracle 8 environment and developer/designer 2000. Resumes should be sent to hotjobs@nww.com.

NET2S

Network Service Solutions

NET2S is a leading International Consulting and Engineering firm specializing in networking and communications technologies. As an industry leader we seek to provide our Global 500 clientele with creative people who implement innovative technological solutions. Our goal is to offer unparalleled Professional Services on mission critical systems and networks. We are capable of facilitating all phases of the systems and engineering life cycle: Planning, Architecture and Design, Deployment and Integration as well as Technical Operations.

Presently we are seeking qualified networking and systems engineers to our team. If you possess skills in the following areas please apply:

- Sr. Network Engineers (Cisco, Nortel)
- Unix Administrator
- TIBCO Engineer
- Network Security Specialist
- Telecom. Engineer
- Software Developers

All positions require BS/MS degree with a minimum of 2 to 3 years of experience in the field. Must possess excellent communication skills as well. NET2S offers a competitive salary, with an excellent benefits package including medical, dental and 401(k). Relocation assistance may be provided. For immediate consideration, please send your resume to: NET2S, 82 Wall Street Suite 400, New York, NY 10005; Fax: (212) 279- 1960; Phone (212) 279-6565; or Email: jobus-ny@net2s.com

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firstname_lastname@nww.com

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NetworkWorld

EDITORIAL INDEX

3Com36
A
Aelita38, 40
Agere Systems21
Akamai Technologies26
AOL Time Warner10
AT&T1,23
B
BindView38, 40
C
Cisco1, 10, 17, 43
Corel29
Corrigent Systems27
Covad Communications8
Cox Business Services1
Cox Communications10
Critical Path38
Crossroads Systems17
D
DataViz30
Digital Island26
E
EMC1, 17
Ericsson27
Excite10
F
Fischer International29

H
Hewlett-Packard1, 8
I
IBM14
Integral Access27
Intel8
Intellispace23
Interland23
iPlanet38
K
Kontiki29
L
Lotus36
M
Managejobs21
Mangosoft21
McAfee.com29
Metricom23
Micron Electronics23
Microsoft8, 10, 37, 38
Mirror Image26
N
NetIQ38, 40
NetPro38, 40
NetVision38
Nextel Communications23
Nortel1

Novell38
O
OneStar Communications27
P
Palm30
PatchLink38, 40
Q
Quantum8
Quest Software38, 40
Qwest Communications10
R
RoadRunner1
S
Siemens17, 29
SoftQuad Software29
Speedera Networks12, 26
V
Verity10
Verizon Wireless27
W
WorldCom23
WQuinn17
Z
Zemba62

ADVERTISER INDEX

AdvertiserPage #URL
Avocent51www.avocent.com
Check Point Software9www.checkpoint.com
Compaq Computer Corp19www.compaq.com
Computer Associates4www.ca.com
DLTape Technology22www.NVDSuperdellTechnology.com
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Secure, continued from page 1

Some industries, such as defense and financial, require technology to meet privacy and confidentiality mandates. But otherwise, use of encrypted e-mail has hit a virtual dead end.

Ferris Research, which tracks the messaging market, estimates that less than one in a thousand corporate employees sends encrypted e-mail with any regularity. This despite the fact that e-mail, when sent across the Internet, can be compared with a postcard that anyone savvy enough to pull it off the wire can read.

"I still believe encrypted e-mail is something the enterprise wants and will be a stimulus for e-business," says David Ferris, president of Ferris Research. "When it is easy to do, users will do it."

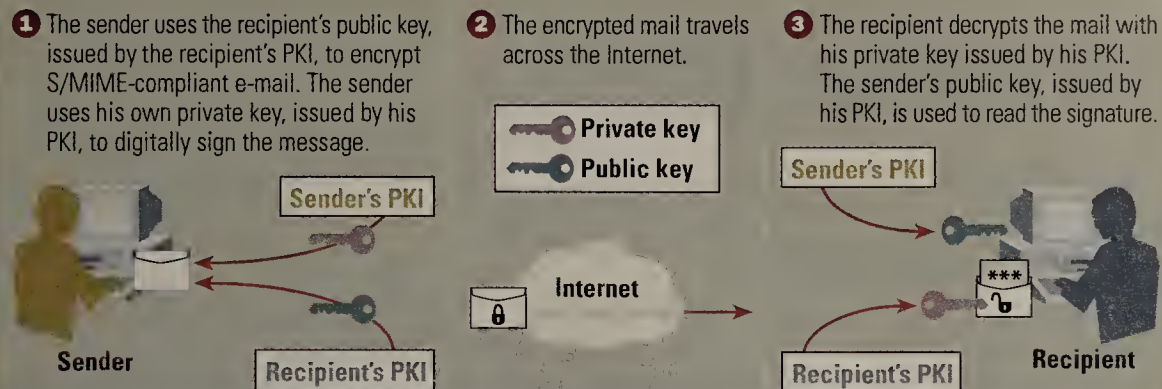
And there's the rub. Current standards do not make it easy. And a handful of products for secure messaging that have popped up in the past few years, from companies such as HushMail, Zixit, Sigaba and TumbleWeed, only lessen the burden. And secure e-mail gateways, from companies such as TFS Technologies, Viasec and TumbleWeed, still require complex infrastructure for both sender and receiver.

But perhaps the biggest limiting factor is that end users don't seem to have much concern for e-mail beyond hitting the send button.

"Users seem to trust the Internet like they trust a telephone conversation," says Dave Bailey, e-commerce and messaging architect for Imerys, a global leader in minerals processing. Bailey remembers a

How to safeguard your e-mail

To send encrypted mail, both sender and recipient must have a public-key infrastructure available on their corporate network that trusts the public and private key pairs issued by each other's PKI.



failed project a few years back to use encrypted mail.

"It worked on some occasions and not on others." He says the problem is that to be effective nearly every other company needs to do it and "that's when it gets complex."

Others note that even when companies make secure e-mail technology available to end users, the technology gets little use.

"We have basic encryption internally on our Lotus Notes system and it's an option available to every user — but almost no one uses it," says John Shaull, senior tech analyst and Notes administrator for Chicago Bridge and Iron, which manufactures storage tanks and water towers. He says there's no concern about encryption because most e-mail contains only general conversation.

A management headache

But there also is an administrative issue in that encrypted e-mail makes it more difficult to move users as they transfer through the company. "If the user has encrypted mail, we

have to transfer the entire user account instead of just creating a new one and linking it to the old account. If the mail is encrypted the new account won't have access to that mail. It creates more problems than value."

Shaull instead uses corporate policy to control the content of e-mail, such as message size, and appropriate language and attachments. And he enforces the policies with technology called MailSweeper from Baltimore Technologies, which compares e-mail against set policies.

"It's wise to create internal policies for usage of the Web, e-mail and instant messaging," says Robert Mahowald, an analyst with IDC. "Those policies are better protection than encryption in the long run."

And creating those policies is easier than building an infra-

structure for encrypted e-mail. The standard for encrypted mail, the Secure/Multipurpose Internet Mail Extensions (S/MIME) was created in 1995 and completed in July 1999. It requires the use of certificates and keys as part of a public-key infrastructure (PKI), which is complex and costly to build. Gartner estimates that deploying PKI software in-house typically costs \$150 to \$180 per user for 5,000 to 25,000 users.

"The industry thought [secure mail] would become as ubiquitous as MIME given the large amount of vendor support," says Paul Hoffman, director of the Internet Mail Consortium and a *Network World* columnist, recalling the days when the fuse was lit on encrypted mail. The hype was that the widespread adoption of S/MIME would make pri-

vacy, data integrity and authentication common features of e-mail.

"All the pieces fit into place except user education and easy-to-use tools for trust management," he says.

Trust is a major issue.

"We have a key management and certificate authority installed but we don't use it much," says Teri Harrison, messaging manager for Baker & Hostetler, a law firm with 10 offices across the U.S. "The problem is the recipients don't trust our certificate authority." Harrison says she has found other ways to build trust, including using common VeriSign certificates, bypassing the Internet with direct e-mail connections to clients, using a VPN for some communications, and even establishing some PGP accounts for use with one client.

But she admits it's a lot of administrative work for little return.

"Actually, we have very few cases that require signed and encrypted e-mail," she says.

But others do have that need and must go through the same trouble as Harrison.

Marv Makie, IT security manager at United Defense LP in Arlington, Va., says his firm has frequent communications with the Navy, which requires secure messaging. And since the Navy is using Network Associates' Corporate PGP, United Defense has to use it to share sensitive information with the Navy.

"It forced me to purchase the PGP corporate package," Makie says. "All of our laptops now have PGP for mail and file encryption."

Those without such a requirement don't want to go through that kind of trouble.

"It's a point application that not everyone needs, so companies don't want to pay for it," says James Kobielus, an analyst with The Burton Group and a *Network World* columnist.

Plus, Kobielus says, there is another more powerful factor.

"There is already a basic level of trust. Until users hear about eavesdropping, they'll trust the current system even with sensitive traffic."

Senior Writer Ellen Messmer contributed to this report.

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OPES, continued from page 8

"I think we have an understanding [among the IETF leadership] that OPES is a tool that we expect people to use reasonably, so it's reasonable to do," Alvestrand says.

Central to the debate over OPES is the reality that between a typical Web server and an end user are many interim devices, including caching systems and CDNs.

Most Web pages are generated on the fly using information culled from different databases and content providers.

OPES is a framework that would let these interim devices further customize Web pages using proxies. These proxies would be connected to Web servers, CDNs, ISP cache arrays or Web browsing clients.

OPES proponents say their

boxes would be under the control of Web publishers or would provide services that Web publishers request. Both the Web publisher and service provider would develop rules that specify when and how to execute OPES services.

"What OPES is trying to do is standardize one of the plugs that fits into the overall Web architecture," says Ned Freed, a director of the IETF's Applications Area.

"The problem is that you could put that plug on an unauthorized service," he adds.

He says the IETF ought to develop the OPES concept with built-in security measures rather than letting the marketplace create its own OPES-like products.

"My belief is that standardization and control of OPES is better than [the alternative]," Freed says. ■

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Going for the gold at the IT Olympics

ast week, in the fine online publication from the U.K. called Need-To-Know (www.ntk.net), I found the most wonderful video (see www.ntk.net/ballmer/dancemonkeyboy.mpg). It was of Microsoft CEO Steve Ballmer dancing around on a stage hollering, "Give it up for me" and "I love this company" demonstrating that he's not quite ready for events like the "Escape from Alcatraz" Triathlon just held in San Francisco (www.bayinsider.com/partners/alcatraz/).

To compete in such an event requires grit and gumption, and my excuse is that if it wasn't for my knee operation ("Pain from the knee and the Jukebox," www.nwfusion.com, DocFinder: 5538), I'd be right

there alongside my brother-in-law Quinn, who was crazy (and fit) enough to participate.

Yep, to be a contender you have to be committed, focused and determined. That doesn't stop you from being realistic about winning or — given the competition — not

winning, but you have to be in there to do more than try.

In the network and computer industries we aim to compete seriously and, given the hours many of us work, the concept of marathon performance is not absent from our world. Thus, I would like to offer a plan for an IT Olympics that will test the mettle of the best of our industries have to offer:

Event 1: Long-distance customer service. Contestants will line up on the starting grid with telephones with faulty headsets and attempt to diagnose problems presented by end users, most of whom have no understanding of the subject at hand and speak something that sounds like normal language but with a restricted vocabulary.

This event lasts for eight hours a day, five days per week, and the last competitor to attempt to take his life will be

declared the winner.

Note: after this event, psychiatric help will be made available to all finalists.

Event 2: Budget balancing. Contestants will attempt to create a budget for staffing a programming, support or other technical department, buying software and hardware and then run the whole mess for less money than the sales department spends on one of their bogus sales meetings at some exotic hotel where they all manage to eat to excess, get hideously drunk, smoke too many cigars and play golf while the rest of the company is covering for their sorry asses.

Event 3: Disappearing Web sites. In this event, contestants will attempt to figure out how and why Fidelity.com disappears from view when the CEO wants to access it, while sites such as eBay never go away.

And they'll do this while dealing with enraged users like the fat guy in shipping who is complaining about not being able to reach Fedex.com, but who is really complaining because he can't access his bowling league site.

Event 4: Hitting the moving target. Armed only with the chicken scratches drawn on a restaurant napkin by the CEO and vice president of marketing, contestants have to implement a major strategic network development such that any random request up to and including a complete redesign can be accommodated within 48 hours. Contestants who attempt to assault members of their senior management will be disqualified.

Event 5: Synchronized installation. Teams are tasked with installing an entire departmental network over a weekend armed only with a screwdriver, an endless supply of pizza and soft drinks, and only the vaguest site plan.

You will agree that these are fine and worthy events for us sturdy IT professionals. My only concern is now getting Mr. Ballmer in shape.

Enter for events at nwcolumn@gibbs.com.



MARK
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The latest on the
Internet industry

Start-up Zembu hopes to do for transactional applications what Akamai and others are doing for static content: Deliver the goods quickly and reliably enough to keep end users coming back for more.

"Moving a picture of a product to the customer's desktop is not where the money is made," says **David Henkel-Wallace**, a Zembu founder and the company's CTO. "The money is made when the transaction is actually done."

The distinction is an important one.

Zembu's distributed-application technology targets global companies looking to provide optimum performance to e-commerce customers or corporate intranet users over private networks and the Internet.

The software consists of a central command console from which IT professionals deploy and manage distributed applications, and a read/write server that performs database reads and writes on the customer's back end and at the various far-flung data centers. End users see faster response times because they are interacting with a local copy of the application that fetches only data pertinent to the transaction from its centralized database, Henkel-Wallace says.

Only one performance measurement really matters, he adds: "Can the guy at the end of the network staring at his screen get what he wants?"

Such hasn't been the case for **British Petroleum** employees looking to use an internal reporting application. According to Henkel-Wallace, only 40% of BP's employees are able to use the app at anything approaching satisfactory levels.

BP is piloting Zembu's software and Henkel-Wallace believes it can boost that 40% figure up to near 100%.

Based in Palo Alto, Zembu employs 60 and is operating on a \$25 million stash put up by investors that include Oak Hill Venture Partners and Hummer Winblad.

With the jury still out on Akamai and other content delivery networks, there is reason to question the market for Zembu's software, which will cost hundreds of thousands of dollars to deploy.

But Henkel-Wallace believes Zembu has a leg up on success in part because it is not asking enterprise customers to relinquish control of their applications and data.

"We sell software. So this is your equipment under your management," he says. "You're not buying a service from some third-party supplier. . . . We've found that in the enterprise market that's a big deal."

Did you see that judges from the **9th U.S. Circuit Court of Appeals in San Francisco** have their robes in a bunch over the monitoring of employee e-mail and Web use? It's not a case before them, mind you. The jurists are themselves aggrieved employees who consider the snooping by their employer to be a privacy violation . . . and perhaps a legal one. They went so far as to order an IT worker to disable the monitoring software for a week in protest.

Where have these judges been? A recent survey shows that fully one-third of wired workers have their e-mail and surfing monitored. Five years ago you could have counted the distrustful/paranoid companies on one hand.

This horse left the barn long before those California judges decided it was time to make a stink. Corporate America has decided — en masse — that monitoring is necessary to keep worker noses to the grindstone and corporate butts out of sexual harassment slings.

Both premises remain highly debatable, if you enjoy purely academic arguments. It would take serious action by Congress at this point to reverse the monitoring tide. Just don't hold your breath waiting for our lawmakers to cross Big Business.

The American worker — even a judge — has only one recourse: Presume the boss is watching, and act accordingly.

E-mail is not monitored here . . . or so I'm told. The address is buzz@nwv.com.



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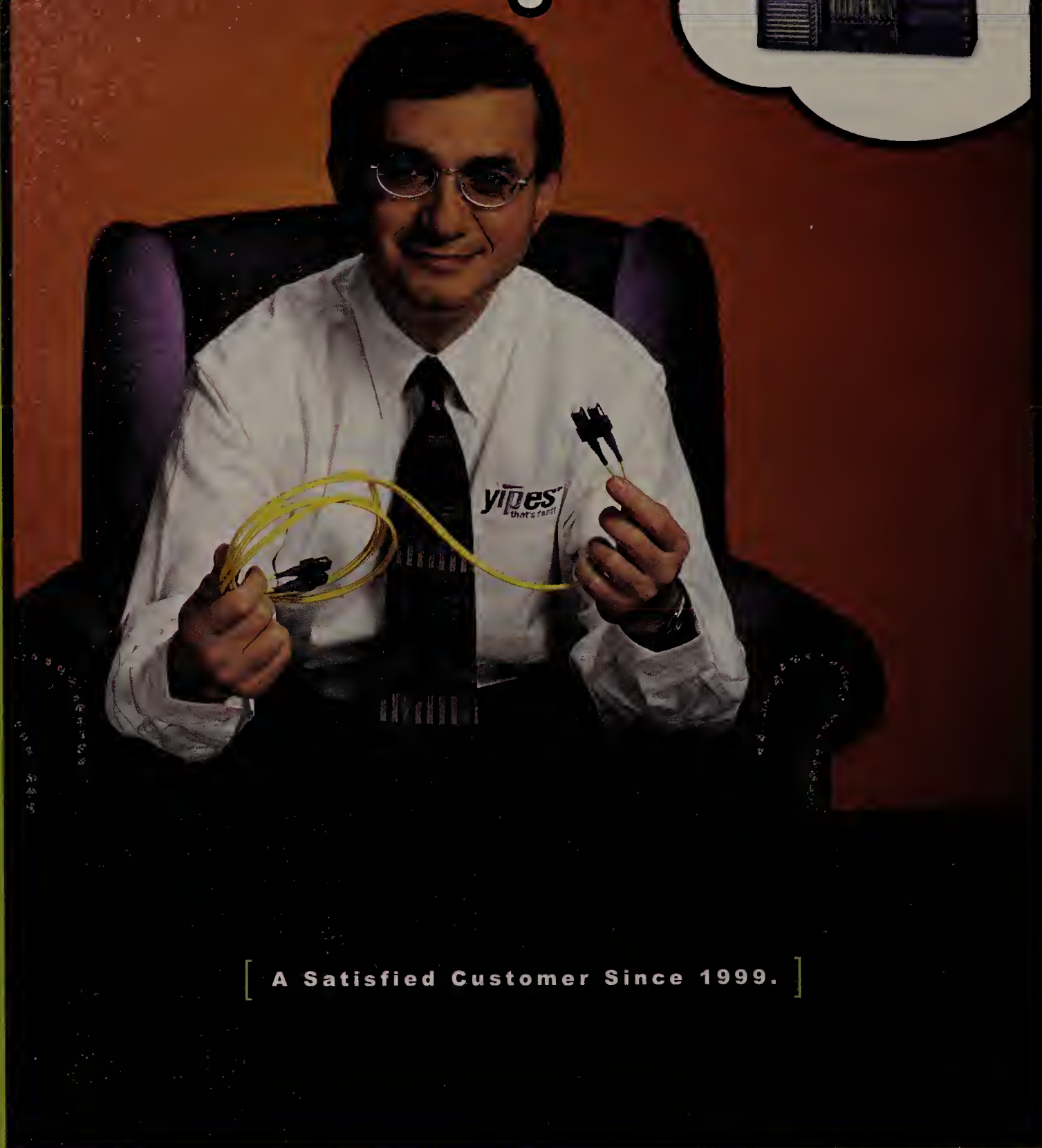
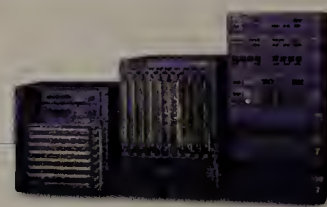
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